SUZUKI

GS850G

SERVICE MANUAL

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(英)

SUZUKI MOTOR CO., LTD. PRINTED IN JAPAN JUNE, '83 (TK)

GROUP INDEX (1/2)

GENERAL INFORMATION	1
SERVICE SPECIFICATIONS	2
PERIODIC MAINTENANCE	3
SPECIAL MATERIALS	4
SPECIAL TOOLS	5
TROUBLE SHOOTING	6
ENGINE	7
SHAFT DRIVE	8
FUEL SYSTEM & CARBURETORS	9
EMISSION CONTROL & REGULATIONS	10
CHASSIS	11
ELECTRICAL SYSTEM	12
INSPECTION AT SETTING-UP	13

GROUP INDEX (2/2)

GS850GT	14
GS850GLT	15
GS850GX/GLX	16
GS850GZ	17
GS850GLZ	18
GS850GD/GLD	19

FOREWORD

The SUZUKI GS850G has been developed as a companion motorcycle to the GS750 and GS1000. It is packed with highly advanced design concepts including a maintenance-free shaft drive mechanism. Combined with precise control and easy handling, the GS850G provides excellent performance and outstanding riding comfort.

IMPORTANT

All street-legal Suzuki motorcycles with engine displacement of 50 cc or greater are subject to Environmental Protection Agency emission regulations. These regulations set standards for emission control, and also set specific servicing requirements. This manual contains all of the necessary information that is required to properly inspect and service the GS850G in accordance with the EPA regulations.

Primarily, the emission components which can effect the emission output of the GS850G consist of the carburetors and crankcase breather device. Emission control information is contained in the Fuel System chapter and the Emission Control chapter. We strongly suggest that the chapter on Emission Control be reviewed before any type of service work is performed.

Further information concerning the EPA emission regulations and U.S. Suzuki's emission control program can be found in the U.S. SUZUKI EMISSION CONTROL PROGRAM MANUAL.

SUZUKI MOTOR CO., LTD.

Motorcycle Technical Service Department

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VIEW OF SUZUKI GS850G

Right side

Left side

GENERAL INFORMATION

CONTENTS

IDENTIFICATION TABLE 1-2
FUEL, OILS AND BRAKING-IN PROCEDURE 1-2
ORIENTATION 1-3
SERVICE SPECIFICATIONS 1-4

GENERAL INFORMATION

IDENTIFICATION TABLE

SERIAL NUMBER LOCATION

The frame serial number ① is stamped on the steering head pipe. The engine serial number ②is located on the right side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.

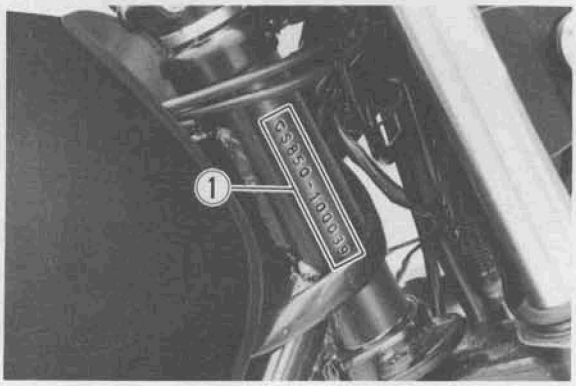


Fig. 1-1

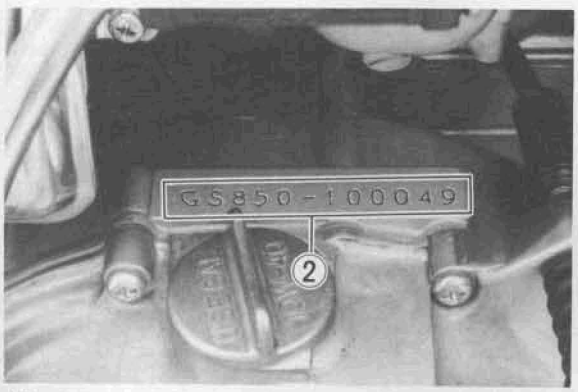


Fig. 1-2

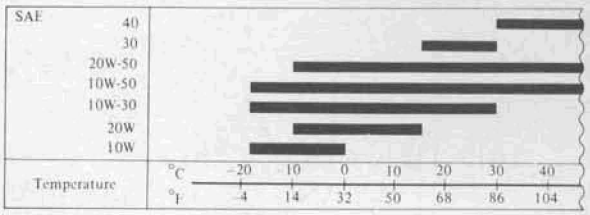
FUEL, OILS AND BREAKING-IN PROCEDURE

FUEL

Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research method.

ENGINE OIL

Be sure that the engine oil used comes under API classification of SE and that its viscosity rating is SAE 10W/40. If SAE 10W/40 motor oil is not available, select the oil viscosity according to the following chart:



GEAR OIL

Use SAE 90 hypoid gear oil which is rated GL-5 under API classification system. If you operate the motorcycle where ambient temperature is below 0°C (32°F), use SAE 80 hypoid gear oil.

BRAKE FLUID (for front and rear brakes)

Specification and classification:
DOT 3, DOT 4

NOTE:

1) Since the brake system of this motorcycle is filled with a glycol-based brake fluid by the manufacturer, do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will result.

2) Do not use any brake fluid taken from old or used or unsealed containers.

3) Never re-use brake fluid left over from the previous servicing and stored for a long priod.

FRONT FORK OIL

SAE 10W/20

BREAKING-IN PROCEDURE

During manufacture only the best possible materials are used and all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to "BREAK-IN" before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. The general rules are as follows:

1. Keep to these break-in engine speed limits:

Initial 500 miles (800 km)	Below 4 000 r/min
Up to 1 000 miles (1 600 km)	Below 6 000 r/min
Over 1 000 miles (1 600 km)	Below 9 000 r/min

2. Upon reaching an odometer reading of 1 000 miles (1 600 km), you can subject the motorcycle to full throttle operation.
   However, do not exceed 9 000 r/min at any time.
   Do not maintain a constant speed for a long period. Try to vary throttle position.

ORIENTATION

CYLINDER IDENTIFICATION

The four cylinders of this engine are identified as No. 1, No. 2, No. 3 and No. 4 cylinder, as counted from left to right (as viewed by the rider on the seat).

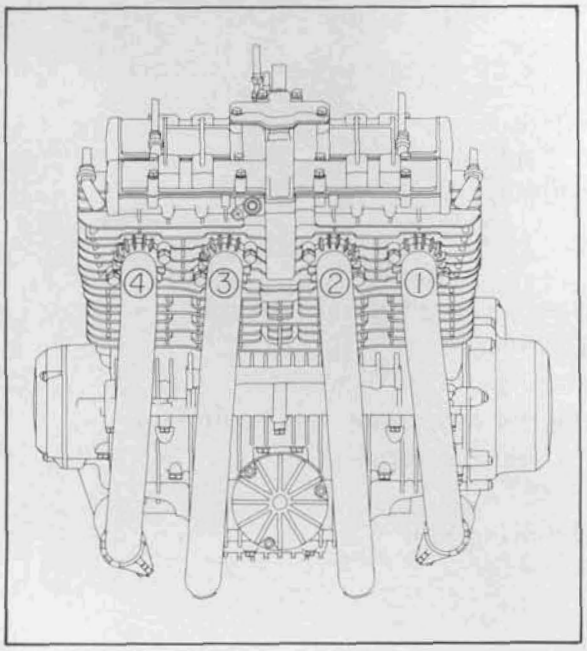


Fig. 1-3

LOCATION OF PARTS

① Tachometer
② Ignition switch
③ Choke knob
④ Front brake lever
⑤ Throttle grip
⑥ Rear brake pedal
⑦ Foot rests
⑧ Speedometer
⑨ Clutch lever
⑩ Fuel tank cap
⑪ Gear shift lever

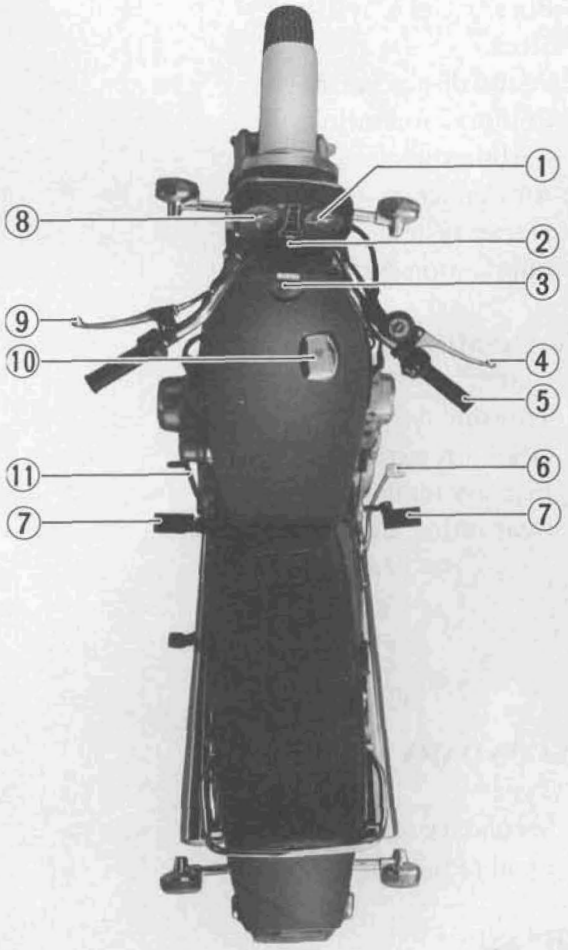


Fig. 1-4 Left ←→ Right

SERVICE SPECIFICATIONS

DIMENSIONS AND WEIGHT

Overall length	2 230 mm (87.8 in)
Overall width	865 mm (34.1 in)
Overall height	1 190 mm (46.9 in)
Wheelbase	1 490 mm (58.7 in)
Ground clearance	160 mm (6.3 in)
Dry weight	253 kg (558 lbs)
Gross vehicle weight rating	455 kg (1 003 lbs)

ENGINE

Type	Four-stroke cycle, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm^3 (51.4 cu.in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI VM26SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric and kick
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 00
Trail	113 mm (4.45 in)

Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50H 19 4PR
Rear tire size	4.50H 17 4PR
Front tire pressure	1.75 kg/cm² (25 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Battery ignition
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 500 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES
Spark plug gap	0.6—0.8 mm (0.024-0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/15A

CAPACITIES

Fuel tank including reserve		22 L (5.8 US gal)
Reserve fuel		4.2 L (1.1 US gal)
Engine oil	change	2.8 L (3.0 US qt)
	filter change	3.6 L (3.8 US qt)
	overhaul	3.8 L (4.0 US qt)
Secondary bevel gear oil		340—400 ml (11.5—13.5 US oz)
Final bevel gear oil		280—330 ml (9.5—11.2 US oz)
Front fork air pressure		0.6–1.2 kg/cm² (8.5–17 psi)
Front fork oil (At time of overhaul and replacement)		251 ml (8.48 US oz) in each leg

* Specifications subject to change without notice.

SERVICE SPECIFICATIONS

CONTENTS

SERVICE SPECIFICATIONS 2- 2
- ENGINE TOP END 2- 2
- ENGINE LOWER END 2- 4
- LUBRICATION SYSTEM 2- 4
- CLUTCH 2- 4
- TRANSMISSION 2- 5
- SHAFT DRIVE 2- 5
- CARBURETOR 2- 6
- ELECTRICAL 2- 6
- BRAKE + WHEEL 2- 7
- TIRE PRESSURE 2- 7
- SUSPENSION 2- 7
- FUEL AND OIL CAPACITY 2- 8

TORQUE TABLE 2- 9
- ENGINE 2- 9
- CHASSIS 2-10
- TIGHTENING TORQUE CHART 2-10

SERVICE SPECIFICATIONS

ENGINE TOP END

VALVES + GUIDES

Unit: mm (in.)

Item		Standard	Limit
Valve lift	IN	8.0 (0.31)	–
	EX	7.5 (0.30)	–
Tappet clearance or valve clearance (cold engine)	IN/EX	0.03–0.08 (0.001–0.003)	
Valve Guide-Valve Stem Clearance	IN	0.025–0.055 (0.0009–0.0022)	0.35 (0.014)
	EX	0.040–0.070 (0.0016–0.0028)	0.35 (0.014)
Valve Guide I.D.	IN/EX	7.000–7.015 (0.2756–0.2762)	–
Valve Stem O.D.	IN	6.960–6.975 (0.2740–0.2746)	–
	EX	6.945–6.960 (0.2734–0.2740)	–
Valve Stem Runout (max.)	IN/EX	–	0.05 (0.002)
Valve Head Thickness (min.)	IN/EX	–	0.5 (0.02)
Valve Seat Width	IN/EX	1.0–1.2 (0.04–0.05)	
Valve Head Radial Runout	IN/EX	–	0.03 (0.001)
Valve Spring Free Length	INNER	35.3–37.0 (1.39–1.46)	33.9 (1.33)
	OUTER	43.0–43.25 (1.69–1.70)	41.3 (1.63)
Valve Spring Tension	INNER	29.3–34.0 kg/23 mm (64.59–74.96 lbs/0.91 in)	–
	OUTER	50.4–58.3 kg/27 mm (111.11–128.53 lbs/1.06 in)	–

CAMSHAFT

Unit: mm (in)

Item		Standard	Limit
Cam Height	IN	36.320–36.360 (1.4299–1.4315)	36.020 (1.4181)
	EX	35.770–35.810 (1.4083–1.4098)	35.470 (1.3965)
Camshaft-Journal Clearance	IN/EX	0.037–0.065 (0.0015–0.0026)	0.150 (0.0059)
Camshaft Journal Holder I.D.	IN/EX	22.012–22.025 (0.8666–0.8671)	–
Camshaft Journal O.D.	IN/EX	21.960–21.975 (0.8646–0.8652)	–
Camshaft Deflection	IN/EX	–	0.1 (0.004)
Cam Chain 20 Pitch Length		–	157.80 (6.213)

PISTON + RING + CYLINDER

Unit: mm (in)

Item		Standard	Limit
Compression Pressure		9–12 kg/cm² (128–171 psi)	7 kg/cm² (100 psi)
Difference between Cylinders		–	2 kg/cm² (28 psi)
Piston-Cylinder Clearance		0.050–0.060 (0.0020–0.0024)	0.120 (0.0047)
Cylinder Bore		69.000–69.015 (2.7165–2.7171)	69.080 (2.7197)
Piston Dia./Measurement Point		68.945–68.960/15 (2.7144–2.7150/0.59)	68.880 (2.7118)
Cylinder Distortion		–	0.2 (0.008)
Cylinder Head Distortion		–	0.2 (0.008)
Piston Ring Free End Gap	1st	Approx. 9.0 (0.35)	7.2 (0.28)
	2nd	Approx. 9.5 (0.37)	7.6 (0.30)
Piston Ring End Gap	1st/2nd	0.1–0.3 (0.004–0.012)	0.7 (0.03)
Piston Ring–Groove Clearance	1st	0.020–0.055 (0.0008–0.0022)	0.18 (0.0071)
	2nd	0.020–0.060 (0.0008–0.0024)	0.15 (0.0059)
Piston Ring Groove Width	1st	1.21–1.23 (0.047–0.048)	–
	2nd	1.21–1.23 (0.047–0.048)	–
	Oil	2.51–2.53 (0.099–0.100)	–
Piston Ring Thickness	1st	1.175–1.190 (0.0463–0.0469)	–
	2nd	1.170–1.190 (0.0461–0.0469)	–
Piston Pin–Pin Bore Clearance		0.002–0.013 (0.0001–0.0005)	0.12 (0.0047)
Piston Pin Bore I.D.		16.002–16.008 (0.6300–0.6302)	–
Piston Pin O.D.		15.995–16.000 (0.6297–0.6300)	–

ENGINE LOWER END

CRANKSHAFT

Unit: mm (in)

Item	Standard	Limit
Connecting Small End Bore – Piston Pin Clearance	0.006–0.019 (0.0002–0.0007)	0.08 (0.0031)
Connecting Rod Small End Bore I.D.	16.006–16.014 (0.6302–0.6305)	–
Piston Pin O.D.	15.995–16.000 (0.6297–0.6300)	–
Connecting Rod Big End Side Clearance	0.10–0.55 (0.004–0.026)	1.0 (0.039)
Connecting Rod Big End Wear	–	0.08 (0.003)
Crankshaft Runout	–	0.05 (0.002)

LUBRICATION SYSTEM

OIL PUMP

Unit: mm (in)

Item	Standard	Limit
Oil Pressure (For 60°C)	Above 0.1 kg/cm^2 (1.4 psi), Below 0.5 kg/cm^2 (7.1 psi) at 3 000 r/min	
Tip Clearance	–	0.20 (0.008)
Outer Rotor Clearance	–	0.25 (0.010)
Side Clearance	–	0.15 (0.006)
Oil Pump Reduction Ratio	87/49 × 33/34 = 1.723	

CLUTCH

Unit: mm (in)

Item	Standard	Limit
Drive Plate Thickness	2.7–2.9 (0.106–0.114)	2.4 (0.094)
Driven Plate Thickness	2.0 (0.08)	–
Driven Plate Distortion	–	0.1 (0.004)
Drive Plate Claw Width	11.8–12.0 (0.46–0.47)	11.0 (0.43)
Clutch Spring Free Length	40.4 (1.59)	38.8 (1.53)

TRANSMISSION

Unit: mm (in)

Item		Standard	Limit
Primary Reduction		1.775 (87/49)	
Secondary Reduction		1.062 (17/16)	
Final Reduction		3.090 (34/11)	
Gear Ratios	Low	2.500 (35/14)	
	2nd	1.777 (32/18)	
	3rd	1.380 (29/21)	
	4th	1.125 (27/24)	
	Top	0.961 (25/26)	
Shift Fork–Groove Clearance		0.4–0.6 (0.016–0.024)	0.8 (0.031)
Shift Fork Groove Width		5.45–5.55 (0.215–0.219)	–
Shift Fork Thickness		4.95–5.05 (0.195–0.199)	–

SHAFT DRIVE

Unit: mm (in)

Item	Standard	Limit
Secondary Bevel Gear Backlash	0.08–0.13 (0.003–0.005)	–
Final Bevel Gear Backlash	0.03–0.64 (0.001–0.025)	–
Secondary Drive Bevel Gear Preload	3–5 kg·cm (2.60–4.35 lb·in)	
Secondary Driven Bevel Gear Preload	4–7 kg·cm (3.45–6.05 lb·in)	
Final Drive Bevel Gear Preload	4–8 kg·cm (3.45–6.95 lb·in)	

CARBURETOR

Unit: mm (in)

Item	Specification
Idle R/MIN	950–1 150 r/min
Carburetor Type	MIKUNI VM26SS
I.D. Number	45100
Bore Size	26 (1.0)
Float Height	23–25 (0.91–0.98)
Fuel Level	3–5 (0.12–0.20)
Air Screw	PRE SET
Pilot Screw	PRE SET
Pilot Air Jet	1.2
Pilot Jet	#15
Cut Away	1.5
Jet Needle	5DL36–2
Needle Jet	0–4
Pilot Outlet	0.6
Main Jet	#102.5
By-pass	0.8

ELECTRICAL

Unit: mm (in)

Item	Standard	Limit
Ignition Timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 500 r/min	
Firing Order	1, 2, 4, 3	
Spark Plug	NGK B8ES or NIPPON DENSO W24ES	
Spark Plug Gap	0.6–0.8 (0.024–0.031)	
Contact Point Gap	0.3–0.4 (0.012–0.016)	
Dwell Angle	180°	
Spark Performance	Over 8 mm (0.3 in) at 1 atm	
Condenser Capacity	0.16–0.20 μF	
Ignition Coil Resistance (primary)	Approx. 4 Ω	
Ignition Coil Resistance (secondary)	Approx. 15 kΩ	
Battery Capacity	12 V 50.4 kC (14 Ah)/10 HR	
Specific Gravity	1.28 at 20°C (68°F)	
Regulated Voltage	14–15.5 V at 5 000 r/min	
Alternator No-Load Data	More than 75 V (AC) at 5 000 r/min	
Fuse Size	10/10/10/15A	
Starter Motor Brush Length	12–13 (0.47–0.51)	6 (0.24)

BRAKE + WHEEL

Unit: mm (in)

Item		Standard	Limit
Axle Runout	Front/Rear	–	0.25 (0.010)
Brake Disc Thickness	Front	5.9–6.1 (0.23–0.24)	5.5 (0.22)
	Rear	6.5–6.9 (0.26–0.27)	6.0 (0.24)
Brake Disc Runout	Front/rear	–	0.30 (0.012)
Master Cylinder Bore Dia.	Front	15.87 (0.625)	–
	Rear	14.00 (0.551)	–
Master Cylinder Piston Dia.	Front	15.80 (0.622)	–
	Rear	13.96 (0.550)	–
Brake Caliper Cylinder Bore	Front	42.85 (1.687)	–
	Rear	38.18 (1.503)	–
Brake Caliper Piston Dia.	Front	42.82 (1.686)	–
	Rear	38.15 (1.502)	–
Wheel Rim Runout (Radial & Axial)		–	2.0 (0.08)
Tire Size	Front	3.50H19 4PR	
	Rear	4.50H17 4PR	
Tire Tread Depth	Front	–	1.6 (0.06)
	Rear	–	2.0 (0.08)

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	FRONT						REAR					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	P.S.I.	kPa	kg/cm²	P.S.I.	kPa	kg/cm²	P.S.I.	kPa	kg/cm²	P.S.I.
NORMAL RIDING	175	1.75	25	175	1.75	25	200	2.00	28	225	2.25	32
CONTINUOUS HIGH SPEED RIDING	200	2.00	28	200	2.00	28	225	2.25	32	280	2.80	40

SUSPENSION

Unit: mm (in)

Item	Standard	Limit
Front Fork Stroke	160 (6.3)	
Rear Wheel Travel	100 (3.9)	
Front Fork Spring Free Length	421 (16.6)	416 (16.4)
Front Fork Oil Level	140 (5.5)	

FUEL AND OIL CAPACITY

Item		Specification
Fuel Tank Including Reserve		22 L (5.8 US gal)
Fuel Tank Reserve		4.2 L (1.1 US gal)
Engine Oil	(Change)	2.8 L (3.0 US qt)
	(Filter change)	3.6 L (3.8 US qt)
	(Overhaul)	3.8 L (4.0 US qt)
Front Fork Oil	(Each Leg)	251 ml (8.48 US oz)
Front Fork Air Pressure		0.6–1.2 kg/cm^2 (8.5–17 psi)
Fuel Type		Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.
Engine Oil Type		SAE 10 W/40
Front Fork Oil Type		SAE 10 W/20
Secondary Bevel Gear Oil		340–400 ml (11.5–13.5 US oz)
Final Bevel Gear Oil		280–330 ml (9.5–11.2 US oz)
Bevel Gear Oil Type		Hypoid Gear oil SAE 90, API grade GL-5

* These specifications subject to change without notice.

TORQUE TABLE

ENGINE

	Thread dia.	kg-m	lb-ft
Camshaft holder bolt	6	1.0	7.5
Cylinder head bolt	6	0.9	6.5
Cylinder head nut	10	3.7	27.0
Cylinder head cover bolt	6	0.9	6.5
Crankcase bolt	6	1.0	7.5
Crankcase bolt	8	2.0	14.5
Starter motor bolt	6	0.6–0.9	4.5–6.5
Oil pan nut	6	0.6–0.9	4.5–6.5
Engine mounting bolt	10	3.5	25.5
Engine mounting bolt	12	3.5	25.5
Starter clutch bolt	8	1.5–2.0	11.0–14.5
Cam chain guide No. 2 bolt	6	0.4–0.7	3.0–5.0
Cam chain idler bolt	6	0.6–1.0	4.5–7.5
Air cleaner bolt	6	0.4–0.7	3.0–5.0
Exhaust pipe bolt	8	0.9–1.4	6.5–10.0
Muffler bolt	10	1.8–2.8	13.0–20.0
Oil pressure switch housing bolt	6	0.6–0.9	4.5–6.5
Clutch spring bolt	6	1.1–1.3	8.0–9.5
Clutch sleeve hub nut	24	5.0–7.0	36.0–50.5
Clutch release arm bolt	6	0.6–1.0	4.5–7.5
Gear shifting cam stopper spring holder bolt	14	1.8–2.8	13.0–20.0
Gear shift lever bolt	8	1.3–2.3	9.5–16.5
Generator rotor bolt	12	9.0–10.0	65.0–72.5
Secondary drive gear nut	32	12.0–15.0	87.0–108.5
Secondary drive gear housing bolt	8	2.0–2.6	14.5–19.0
Secondary driven gear nut	14	9.0–11.0	65.0–79.5
Secondary driven gear housing bolt	8	2.0–2.6	14.5–19.0

CHASSIS

	Thread dia.	kg-m	lb-ft
Handle holder bolt	8	1.2–2.0	8.5–14.5
Front fork upper bracket rear bolt	8	1.5–2.5	11.0–18.0
Front fork tube upper pinch bolt (R, L)	10	2.0–3.0	14.5–21.5
Front fork tube lower pinch bolt (R, L)	8	1.5–2.5	11.0–18.0
Steering stem head nut	18	3.5–5.0	25.5–36.0
Front axle shaft nut	12	3.6–5.2	26.0–37.5
Front axle holder nut	8	1.5–2.5	11.0–18.0
Swinging arm pivot shaft bolt	24	0.35–0.45	2.5–3.5
Swinging arm pivot shaft nut	24	11.0–13.0	79.5–94.0
Rear torque link nut	10	2.0–3.0	14.5–21.5
Rear axle nut	16	8.5–11.5	61.5–83.0
Rear shock absorber nut	10	2.0–3.0	14.5–21.5
Rear wheel driven joint nut	10	5.0–6.0	36.0–43.5
Front step bolt	10	2.7–4.3	19.5–31.0

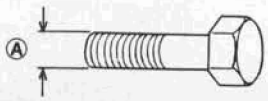
	Thread dia.	kg-m	lb-ft
Front brake caliper mounting bolt	10	2.5–4.0	18.0–29.0
Front and rear brake disc plate bolt	8	1.5–2.5	11.0–18.0
Front brake caliper axle bolt	10	2.5–3.5	18.0–25.5
Front brake master cylinder mounting bolt	6	0.5–0.8	3.5–6.0
Front and rear brake hose union bolt	10	1.3–1.8	9.5–13.0
Front and rear brake oil bleeder bolt	8	0.6–0.9	4.5–6.5
Rear brake caliper mounting bolt	10	2.0–3.0	14.5–21.5
Rear brake caliper axle bolt	10	2.5–3.5	18.0–25.5
Rear brake master cylinder mounting bolt	8	1.5–2.5	11.0–18.0
Final drive gear housing nut	10	3.5–4.5	25.5–32.5
Final drive gear nut	14	9.0–11.0	65.0–79.5
Propeller shaft bolt	8	2.5–3.0	18.0–21.5
Final case oil filler plug	14	2.0–3.0	14.5–21.5
Final gear bearing case bolt	8	2.0–2.6	14.5–19.0
Final gear case shock mount stud bolt	16	9.0–11.0	65.0–79.5

TIGHTENING TORQUE CHART

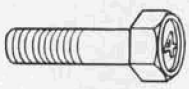
For other bolts and nuts not listed above, refer to this chart:

TIGHTENING TORQUE

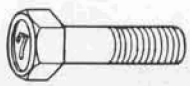
Thread diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1 – 2	0.1 – 0.2	0.7 – 1.5	1.5 – 3	0.15 – 0.3	1.0 – 2.0
5	2 – 4	0.2 – 0.4	1.5 – 3.0	3 – 6	0.3 – 0.6	2.0 – 4.5
6	4 – 7	0.4 – 0.7	3.0 – 5.0	8 – 12	0.8 – 1.2	6.0 – 8.5
8	10 – 16	1.0 – 1.6	7.0 – 11.5	18 – 28	1.8 – 2.8	13.0 – 20.0
10	22 – 35	2.2 – 3.5	16.0 – 25.5	40 – 60	4.0 – 6.0	29.0 – 43.5
12	35 – 55	3.5 – 5.5	25.5 – 40.0	70 – 100	7.0 – 10.0	50.5 – 72.5
14	50 – 80	5.0 – 8.0	36.0 – 58.0	110 – 160	11.0 – 16.0	79.5 – 115.5
16	80 – 130	8.0 – 13.0	58.0 – 94.0	170 – 250	17.0 – 25.0	123.0 – 181.0
18	130 – 190	13.0 – 19.0	94.0 – 137.5	200 – 280	20.0 – 28.0	144.5 – 202.5



Conventional Bolt



"4" Marked Bolt



"7" Marked Bolt

PERIODIC MAINTENANCE

CONTENTS

PERIODIC MAINTENANCE SCHEDULE 3- 2
PERIODIC MAINTENANCE PROCEDURES 3- 3
BATTERY 3- 3
CYLINDER HEAD NUTS AND EXHAUST PIPE BOLTS 3- 3
AIR CLEANER ELEMENT 3- 4
TAPPET CLEARANCE 3- 5
SPARK PLUGS 3- 9
FUEL LINE 3- 9
CONTACT BREAKER POINTS 3- 9
IGNITION TIMING 3- 9
ENGINE OIL 3-11
ENGINE OIL FILTER 3-12
ENGINE IDLE R/MIN 3-12
CLUTCH 3-13
DRIVE SHAFT GEAR OIL 3-14
BRAKES 3-15
BRAKE HOSES 3-15
TIRES 3-16
STEERING 3-17
FRONT FORKS 3-17
CHASSIS NUTS AND BOLTS 3-18

PERIODIC MAINTENANCE

IMPORTANT: The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also enhance the reliability and performance of the motorcycle.

> *NOTE:*
> *More frequent servicing may be performed on motorcycles that are used under extreme service conditions, however, it is not necessary to ensure emission level compliance.*

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and to maintain proper emission levels. Mileages are expressed in terms of kilometers, miles and time for your convenience.

PERIODIC MAINTENANCE SCHEDULE

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST						
	Mile	600	4 000	7 500	11 000	15 000
	Km	1 000	6 000	12 000	18 000	24 000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		—	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		—	C	C	C	C
Tappet clearance		I	I	I	I	I
Spark plug		—	C	R	C	R
Fuel line		Replace every two years				
Contact breaker point		I	I	I	I	I
Ignition timing		I	I	I	I	I
Engine oil		Change oil at initial 1 000 km (600 miles) and initial 3 000 km (2 000 miles), and thereafter change every 3 000 km (2 000 miles).				
Engine oil filter		R	R	R	R	R
Carburetor idle r/min		A	A	A	A	A
Clutch		I	I	I	I	I
Drive shaft gear oil		R	—	R	—	R
Brake hose and fluid		Replace every two years				
Brake		I	I	I	I	I
Tire		I	I	I	I	I
Steering		I	I	I	I	I
Front fork		—	—	I	—	I
		Check air pressure every 6 months.				
Chassis bolts and nuts		T	T	T	T	T

NOTE: T = Tighten, A = Adjust, I = Inspect, R = Replace, C = Clean

PERIODIC MAINTENANCE PROCEDURES

This section describes the service procedures for each section of the Periodic Maintenance requirements.

BATTERY

6 000	12 000	18 000	24 000	km
4 000	7 500	11 000	15 000	miles

1. Remove right frame cover to check battery.
2. Check that the breather pipe is tightly secured and undamaged, and is routed as shown below.

Fig. 3-1

3. Check electrolyte for level and specific gravity. Add distilled water, as necessary, to keep the surface of the electrolyte above the LOWER level line but not above the UPPER level line.

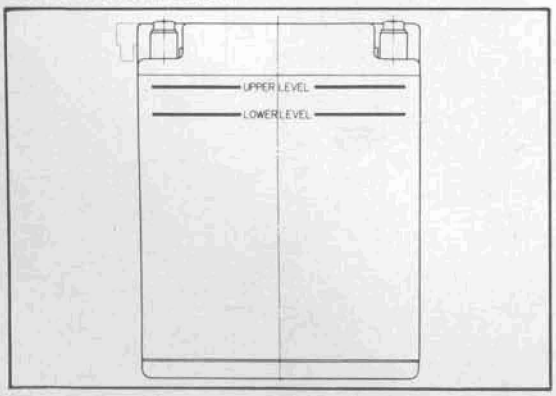


Fig. 3-2

For checking specific gravity, use a hydrometer to determine the charge condition.

Standard specific gravity:	1.28 at 20°C (68° F)

An S.G. reading of 1.22 (at 20°C) or under means that the battery needs recharging off the machine: take it off and charge it from a recharger. Charging the battery in place can lead to failure of the rectifier.

CYLINDER HEAD NUTS AND EXHAUST PIPE BOLTS

1 000	6 000	12 000	18 000	24 000	km
600	4 000	7 500	11 000	15 000	miles

1. CYLINDER HEAD

Remove the fuel tank.

Tighten the twelve 10 mm nuts (14 mm wrench) to the specified torque with a torque wrench sequentially in ascending numerical order with the engine cold.

Cylinder head nut tightening torque	3.5–4.0 kg-m (25.5–29.0 lb-ft)

After firmly tightening the 12 nuts, tighten three 6 mm bolts (indicated as Ⓐ) to the torque value below:

Head bolt tightening torque Ⓐ	0.7–1.1 kg-m (5.0–8.0 lb-ft)

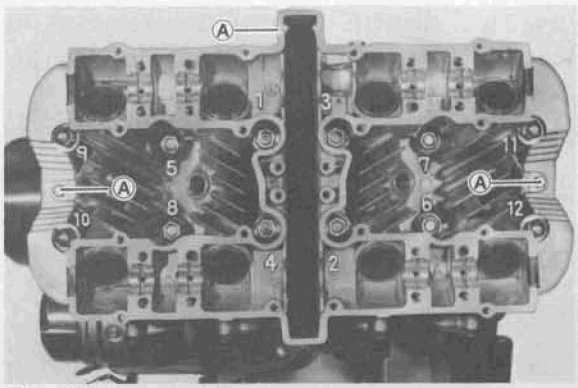


Fig. 3-3

2. EXHAUST PIPE

Tighten the exhaust pipe bolts to the specified torque with a torque wrench.

Exhaust pipe bolt tightening torque	0.9–1.2 kg-m (6.5–8.5 lb-ft)

AIR CLEANER ELEMENT

6 000	12 000	18 000	24 000 km
4 000	7 500	11 000	15 000 miles

If the air cleaner is clogged with dust, intake resistance will be increased with a resultant decrease in output and an increase in fuel consumption.
Check and clean the element in the following manner.

1. Take out air cleaner element ① from the air cleaner case by unscrewing screw ②.

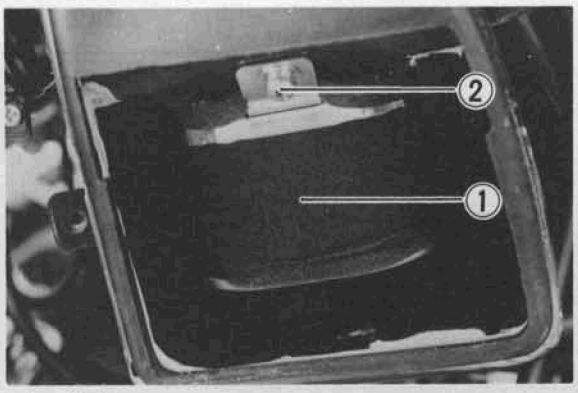


Fig. 3-4

2. Fill a washing pan of a proper size with non-flammable cleaning solvent. Immerse the element in the cleaning solvent and wash it clean.
3. Squeeze the cleaning solvent out of the washed element by pressing it between the palms of both hands: do not twist or wring the element or it will develop tears.
4. Immerse the element in motor oil, and squeeze the oil out of the element leaving it slightly wet with oil.

CAUTION:
Before and during the cleaning operation, inspect the element for tears. A torn element must be replaced.

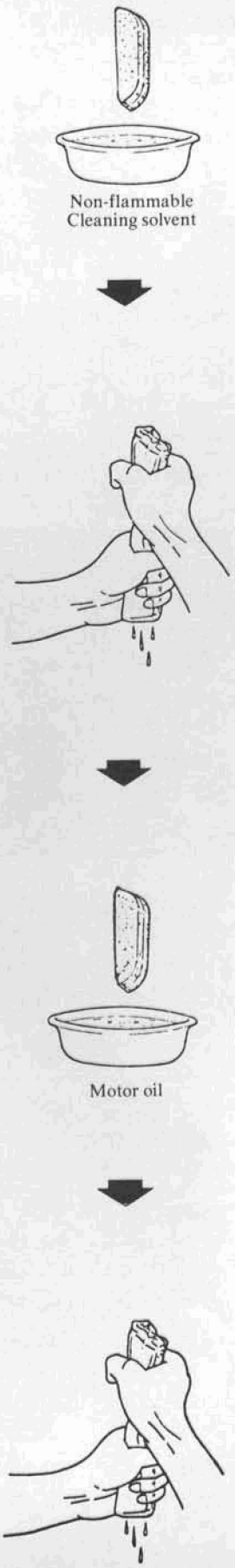


Fig. 3-5

TAPPET CLEARANCE

1 000	6 000	12 000	18 000	24 000 km
600	4 000	7 500	15 000	miles

The tappet clearance specification is the same for both intake and exhaust valves. Too small a tappet clearance may reduce the engine power; too large a tappet clearance increases valve noise and hastens valve and seat wear. When the tappets are set to the specified clearance, the engine will run without excessive noise from the valve mechanism and will deliver full power. In this engine, the tappet clearance is increased or decreased by replacing the shim disc, made of a special wear-resistant material, fitted to the top of the tappet. The shim discs are easy to remove and refit. Tappet clearance adjustment must be checked and adjusted 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.

CHECKING THE TAPPET CLEARANCE

Tappet clearance specification (for both intake and exhaust valves):	0.03–0.08 mm (0.001–0.003 in)

NOTE:

1) The cam must be at position Ⓐ or Ⓑ to check the tappet clearance or to remove the shim disc. Clearance readings should not be taken with the cam in any other position than these two positions.

2) The clearance specification is for a COLD engine.

3) To turn the crankshaft for clearance checking, be sure to use a 19-mm wrench and to rotate in the normal running direction. All spark plugs should be removed.

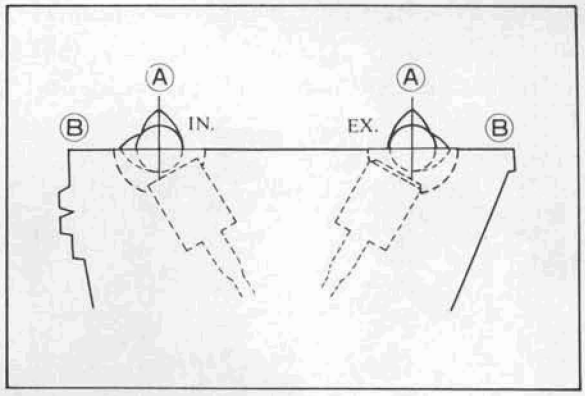


Fig. 3-6

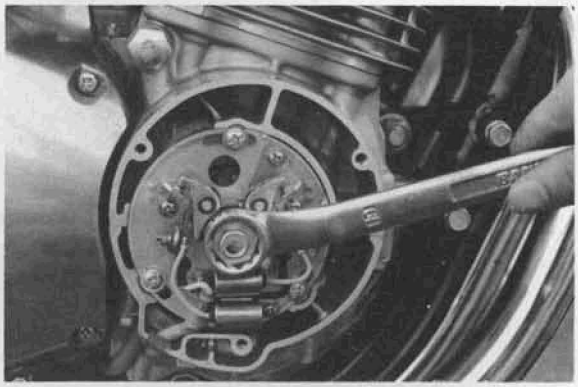


Fig. 3-7

1. Turn crankshaft to bring the exhaust cam of No. 1 cylinder to this position. In this condition, read the clearance at the exhaust tappets of Nos. 1 and 2 cylinders. Use special tool ① on all tappets.

Thickness gauge	09900—20803

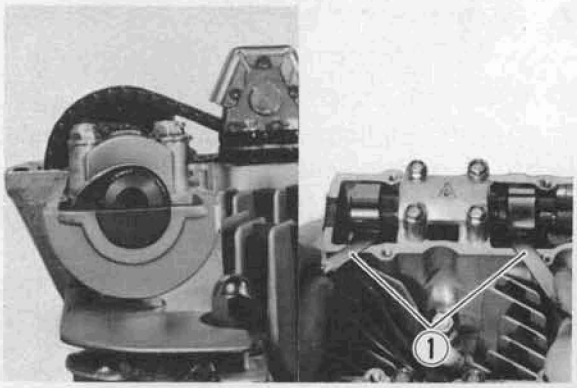


Fig. 3-8

2. After setting the clearance to the specification at the exhaust tappets of Nos. 1 and 2 cylinders, turn the crankshaft 180° (half rotation) to bring the intake cam of No. 1 cylinder to the position indicated.

Read the clearance at the intake tappets of Nos. 1 and 2 cylinders and, if necessary, adjust the clearance to each specification.

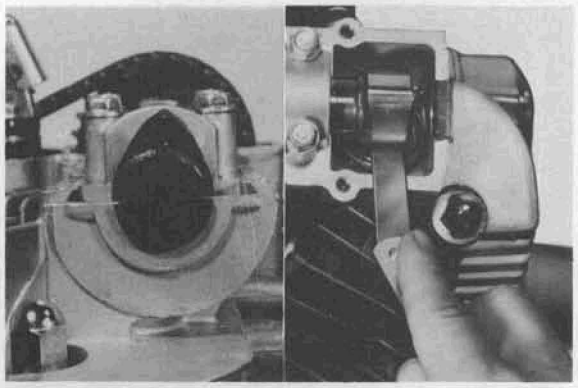


Fig. 3-9

3. Turn the crankshaft a further 180°, bringing the exhaust cam of No. 4 cylinder to the position indicated. Under this condition, repeat the checking and adjusting process outlined in step "1" at the exhaust tappets of Nos. 3 and 4 cylinders.

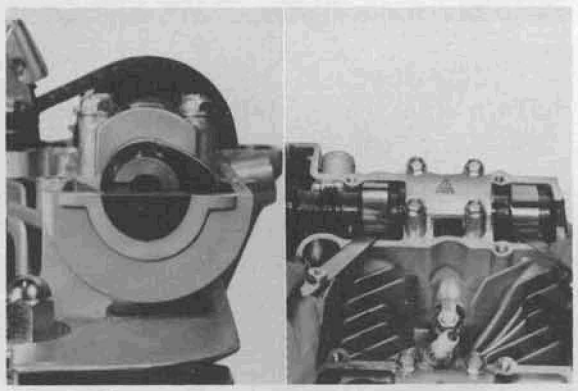


Fig. 3-10

4. Again turn the crankshaft a further 180°, bringing the intake cam of No. 4 cylinder to the position indicated. Similarly check and adjust the clearance at the intake tappets of Nos. 3 and 4 cylinders.

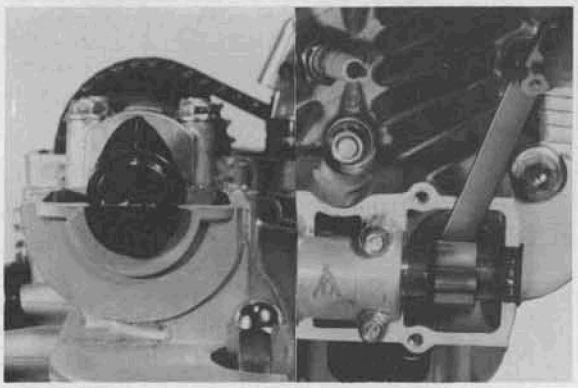


Fig. 3-11

TAPPET CLEARANCE ADJUSTMENT

The clearance is adjusted by replacing the existing tappet shim by a thicker or thinner disc.

1. Place a fingertip on the tappet, and turn it in place to bring notch ① to the position indicated.

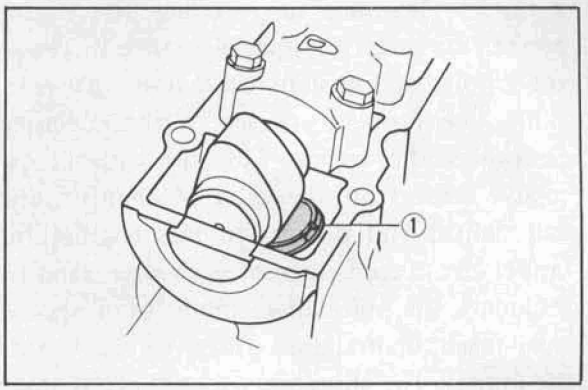
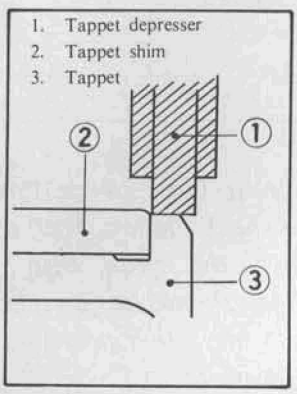


Fig. 3-12

2. Using the special tool, push down the tappet.

NOTE:
Make sure the tool exerts pressure on the tappet correctly, as shown, with the tip hitched securely.

Tappet depressor	09916—64510



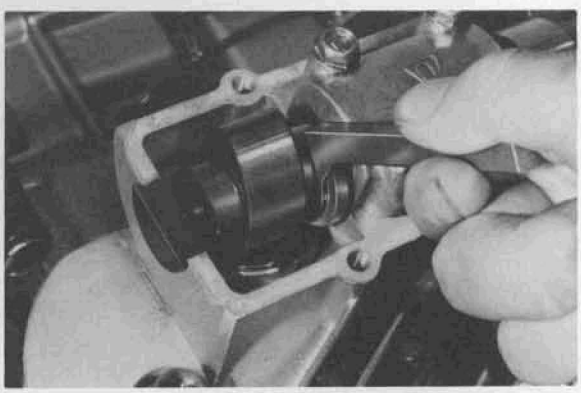


Fig. 3-13

3. Take out the tappet shim from the tappet, using special tool ①.

Forceps	09916—84510

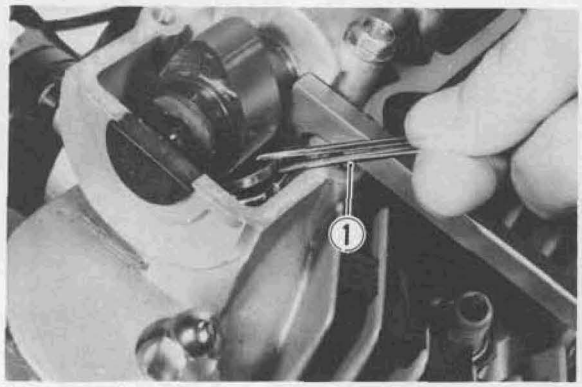


Fig. 3-14

4. Check the figures printed on the shim. These figures indicate the thickness of the shim, as illustrated.

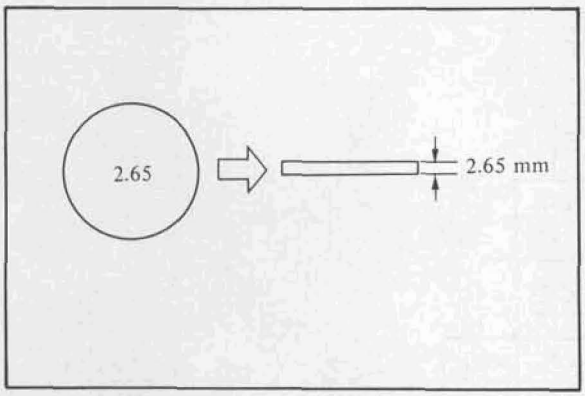


Fig. 3-15

5. Select a replacement shim that will provide a clearance within the specified range (0.03—0.08 mm). For the purpose of this adjustment, a total of 20 sizes of tappet shim are available ranging from 2.15 to 3.10 mm in steps of 0.05 mm. Fit the selected shim to the tappet, with numbers toward tappet. Be sure to check shim size with micrometer to insure its size.

Tappet shim size chart

No.	Thickness (mm)	Part No.
1	2.15	12892-45000
2	2.20	12892-45001
3	2.25	12892-45002
4	2.30	12892-45003
5	2.35	12892-45004
6	2.40	12892-45005
7	2.45	12892-45006
8	2.50	12892-45007
9	2.55	12892-45008
10	2.60	12892-45009
11	2.65	12892-45010
12	2.70	12892-45011
13	2.75	12892-45012
14	2.80	12892-45013
15	2.85	12892-45014
16	2.90	12892-45015
17	2.95	12892-45016
18	3.00	12892-45017
19	3.05	12892-45018
20	3.10	12892-45019

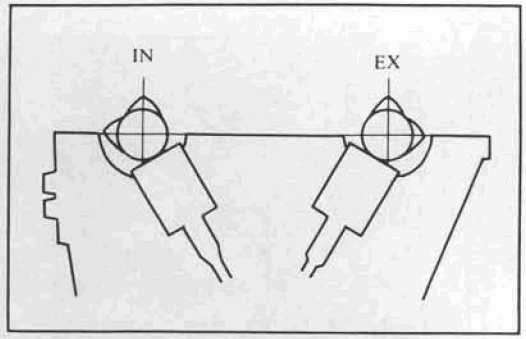
NOTE:
Before fitting the tappet shim to the tappet, be sure to apply engine oil to its top and bottom faces.

6. After replacing the tappet shim, rotate the engine so that the tappet is depressed fully. This will squeeze out oil trapped between the shim and the tappet that could cause an incorrect measurement, then check the clearance again to confirm that it is within the specified range.

SHIM SELECTION CHART

PART NUMBER — PREFIX 12892

P/N SUFFIX-	45000	45001	45002	45003	45004	45005	45006	45007	45008	45009	45010	45011	45012	45013	45014	45015	45016	45017	45018	45019
Tappet Clearance (mm)	PRESENT SHIM SIZE — mm																			
0.00～0.02	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10
0.03～0.08		2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05
0.09～0.13	SPECIFIED CLEARANCE/NO. ADJUSTMENT REQUIRED																			
0.14～0.18	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	
0.19～0.23	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10		
0.24～0.28	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10			
0.29～0.33	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10				
0.34～0.38	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10					
0.39～0.43	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10						
0.44～0.48	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10							
0.49～0.53	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10								
0.54～0.58	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10									
0.59～0.63	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10										
0.64～0.68	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10											
0.69～0.73	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10												
0.74～0.78	2.80	2.85	2.90	2.95	3.00	3.05	3.10													
0.79～0.83	2.85	2.90	2.95	3.00	3.05	3.10														
0.84～0.88	2.90	2.95	3.00	3.05	3.10															
0.89～0.93	2.95	3.00	3.05	3.10																
0.94～0.98	3.00	3.05	3.10																	
0.99～1.03	3.05	3.10																		
	3.10																			



I. Measure tappet clearance. "ENGINE COLD"
II. Measure present shim size.
III. Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is — 0.55 mm
Present shim size — 2.40 mm
Shim size to be used — 2.90 mm

SPARK PLUGS

6 000	12 000	18 000	24 000 km
4 000	7 500	11 000	15 000 miles

At initial 6 000 km, remove the carbon deposits with a wire or pin and adjust the spark plug gap to 0.6—0.8 mm (0.024—0.031 in), measuring with a thickness gauge.
Replace the plugs every 12 000 km and remove the carbon deposits and adjust the gap every 6 000 km after replacing the plugs.
Whenever removing the carbon deposits, be sure to observe the appearance of the plug, noting the color of the carbon deposit. The color indicates whether the standard plug is suitable or not. If the standard plug is apt to get wet, a hotter plug should be used. If the standard plug is apt to overheat, with the porcelain having a whitish appearance, replace with a colder one.

NOTE:
To check the spark plugs, keep the engine running on unleaded gasoline, and if all of the four are either sooty with carbon or burnt white, replace them altogether.

	NGK	NIPPON DENSO
Hot type	B7ES	W22ES
Standard	**B8ES**	**W24ES**
Cold type	B9ES	W27ES

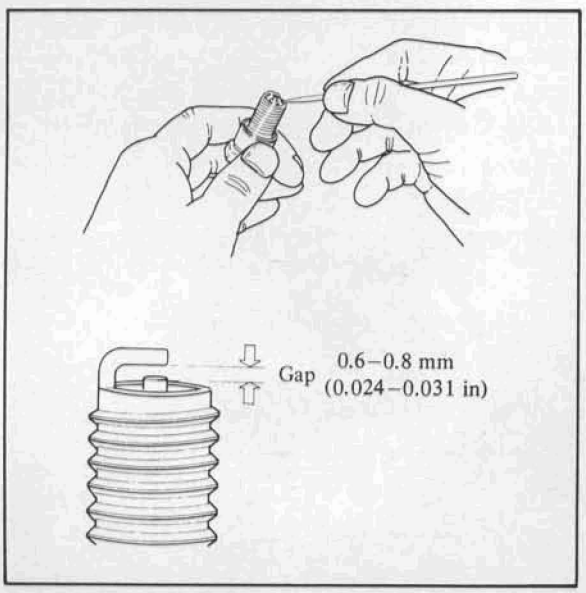


Fig. 3-16

FUEL LINE
(Replace every two years)

Replace the fuel hose every two years.

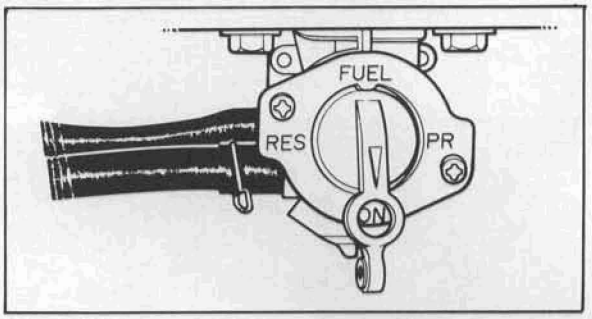


Fig. 3-17

CONTACT BREAKER POINTS

1 000	6 000	12 000	18 000	24 000 km
600	4 000	7 500	11 000	15 000 miles

Check and adjust the contact points as outlined on the next page. Inspect the contact points for wear and burning. If the point faces are dirty, wipe them clean with a clean and dry cloth.

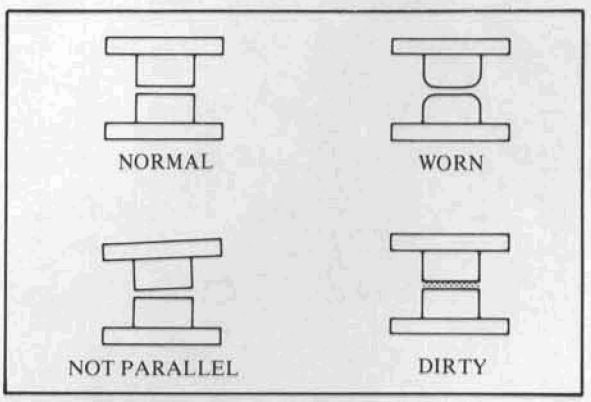


Fig. 3-18

IGNITION TIMING

1 000	6 000	12 000	18 000	24 000 km
600	4 000	7 500	11 000	15 000 miles

Ignition timing specifications

Point gap	0.3–0.4 mm (0.012–0.016 in.)
Spark plug gap	0.6–0.8 mm (0.024–0.031 in.)
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 500 r/min

NOTE:
1) Be sure to use a 19-mm wrench to turn the crankshaft in the direction shown.
2) Remove all four plugs until adjustment is completed.

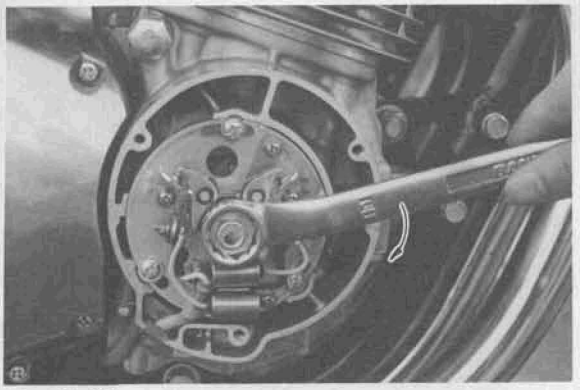


Fig. 3-19

TIMING ADJUSTMENT FOR NOS. 1 AND 4 CYLINDERS

1. Set the contact point gap ① to 0.3—0.4 mm (0.012—0.016 in) in the Nos. 1 & 4 breaker. To adjust the gap, loosen screw ② and displace terminal ③.

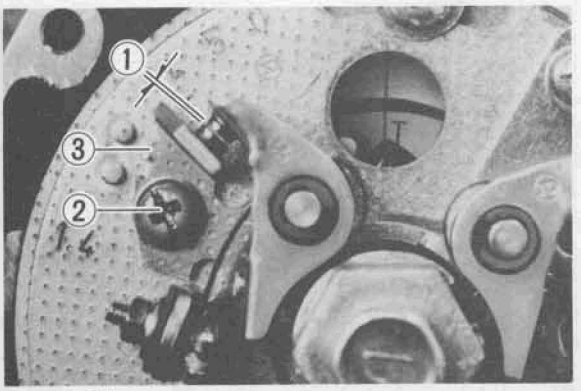


Fig. 3-20

Fig. 3-21

2. Connect timing tester ④ between the (+) terminal of the breaker and ground.

Timing tester	09900—27003

3. Slowly turn the crankshaft in the normal direction until index mark ② (on the Nos. 1&4 side of the advance governor) is aligned with timing mark ④.
   ①: Corresponding to T.D.C. of Nos. 1 & 4 pistons
   ②: Timing index mark "F1.4"
   ③: Ignition advance timing mark

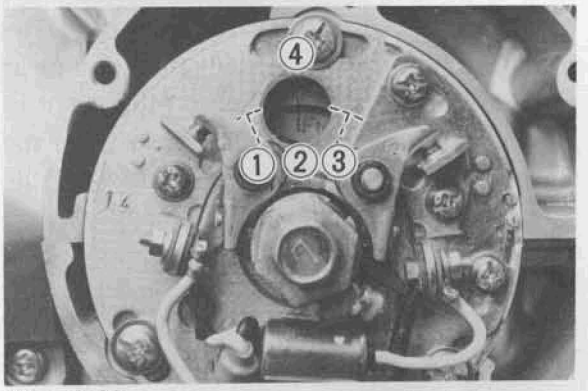


Fig. 3-22

4. With the pistons brought to the specified B.T.D.C. position in Nos. 1 and 4 cylinders, as shown above, loosen three screws ⑤ securing the breaker plate and turn the plate slowly counterclockwise until the contact points begin to separate. Secure the plate in that position by tightening screws ⑤.
5. To check, turn the crankshaft slowly, observing the timing tester. If the breaker contact begins to open just when mark ② comes in line with mark ④, the adjustment is correct and the ignition is timed as specified for Nos. 1 and 4 cylinders.

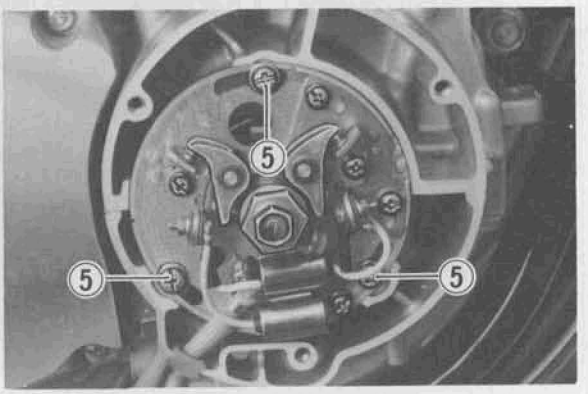


Fig. 3-23

TIMING ADJUSTMENT FOR NOS. 2 AND 3 CYLINDERS

The procedure is identical to the foregoing except for two points:

1. Bring mark "F" (on Nos. 2 & 3 side in the advance governor) into line with the timing mark.
2. Loosen two screws ① and move plate ② counterclockwise to determine its position at the beginning of opening action.

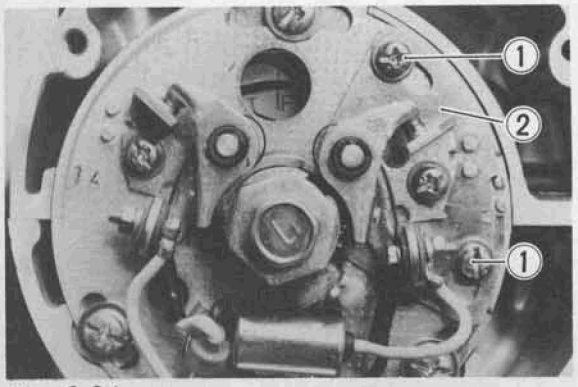


Fig. 3-24

CHECKING IGNITION TIMING WITH THE TIMING LIGHT

After setting the contact points of the twin breakers by adjusting in the above-described manner, check the performance of the timing mechanism using the timing light (09900-27311). Illuminate the advance governor with the timing light and vary the engine speed to see if the ignition is correctly timed or not. The procedure is as follows:

1. Run the engine at a speed not exceeding 1 500 r/min. Under this condition, "F" mark and timing mark should be in perfect alignment: if not, readjust the twin breaker referring to these marks in the advance governor.

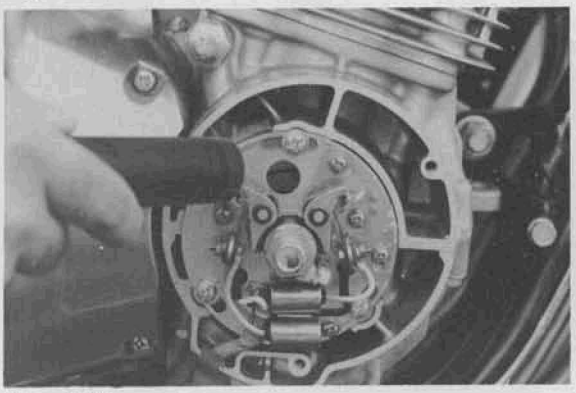


Fig. 3-25

2. Run the engine at a speed above 2 500 r/min, and similarly observe the position of mark ③ relative to mark ④. If the two marks are in line, the ignition is properly advanced.
3. Carry out above steps 1 and 2 for Nos. 2 and 3 cylinders.

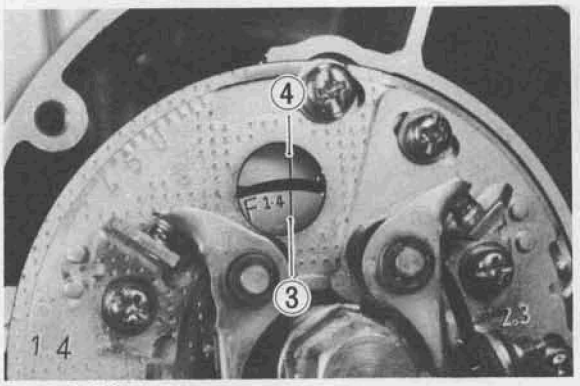


Fig. 3-26

ENGINE OIL

Change Initial 1 000 km (600 mi) and Initial 3 000 km (2 000 mi) and thereafter Change Every 3 000 km (2 000 mi)

The oil should be changed with the engine hot.

The procedure is as follows:

- Keep the motorcycle upright, supported on the center stand.
- Place an oil pan below the engine and drain the oil by removing drain plug ① and filler cap ②.

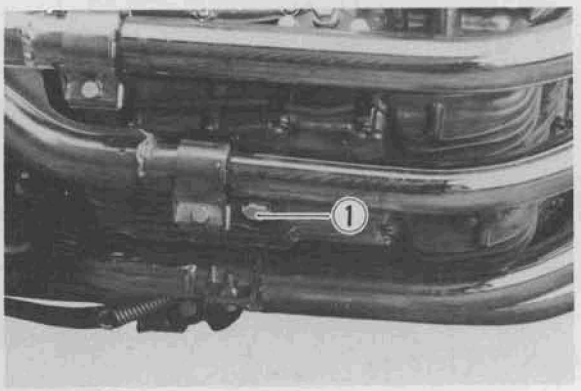


Fig. 3-27

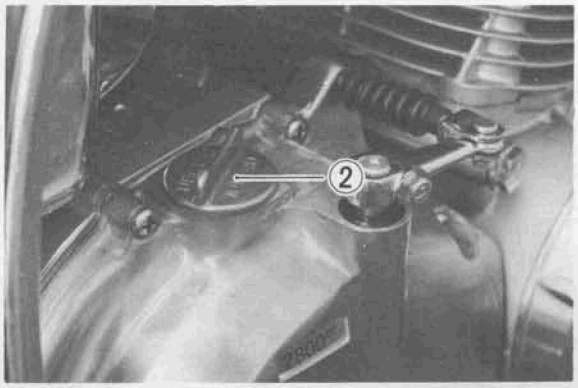


Fig. 3-28

- Fit drain plug ① securely, and add fresh oil through the filler. The engine will hold about 2.8 L (3.0 US. qt) of oil.
  Use API classification of SE oil with SAE 10W/40 viscosity.
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level in level gauge ③. If the level is below mark "F", supply oil to that level.

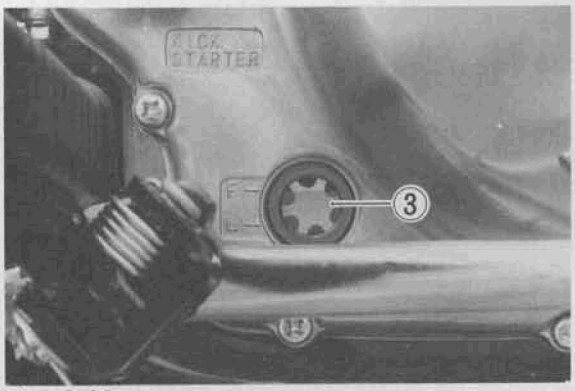


Fig. 3-29

NOTE:
- *When replacing the oil filter, the amount of oil to be replaced is 3.6 L. (3.8 US.qt).*
- *When performing engine overhaul, the amount of oil to be replaced is 3.8 L (4.0 US.qt).*

ENGINE OIL FILTER

1 000	6 000	12 000	18 000	24 000 km
600	4 000	7 500	11 000	15 000 miles

Oil filter replacement at the above intervals should be done together with engine oil change as described in the previous section. After draining engine oil and securely tightening the engine oil drain plug, perform the following:

1. Remove three nuts ②, and remove the cover.
2. Pull out old filter ③, replace with new one.
3. Replace cover, secure nuts ② with applying Thread Lock Cement.
4. Add engine oil.

NOTE:
Pour about 3.6 L (3.8 US.qt) of engine oil into the engine only when changing oil and replacing oil filter at the same time.

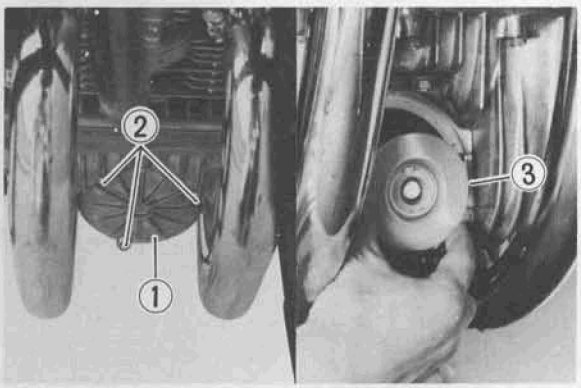


Fig. 3-30

ENGINE IDLE R/MIN

1 000	6 000	12 000	18 000	24 000 km
600	4 000	7 500	11 000	15 000 miles

1. Start up the engine and warm it up by running it at 2 000 r/min for 10 minutes in summer, when ambient temperature is 30°C (86°F), or for 20 minutes in winter, when ambient temperature is down to approx. −5°C (23°F).
2. After the engine warms up, turn the throttle stop screw in or out so that engine runs at 950—1 150 r/min.

CAUTION
No adjustment except the procedure mentioned above is necessary because calibration is performed by carburetor manufacturer.

Fig. 3-31

At the same intervals, adjust the throttle cable play in the following manner:

THROTTLE CABLE ADJUSTMENT

A twin throttle cable system is used on the GS850G: One cable Ⓐ is for pulling and the other cable Ⓑ for returning.

Pulling cable play

The throttle cable should be adjusted to have a slack ① of 3—5 mm (0.12—0.20 in) at the middle point between adjusting holder ② and throttle cable end ③ on the carburetor side.

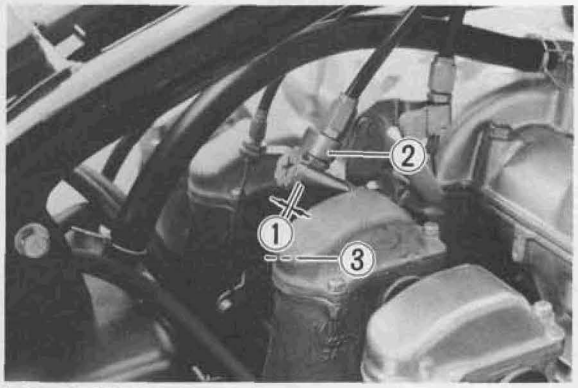


Fig. 3-32

NOTE:
Inspect the cable slack periodically, and if necessary, adjust it to the specified value. The cable end will come out if the play is excessive.

1. Loosen lock nut ④.
2. Turn adjusting nut ⑤ to obtain a cable play ⑥ of 0.5–1.0 mm (0.02–0.04 in).
3. Tighten lock nut ④.

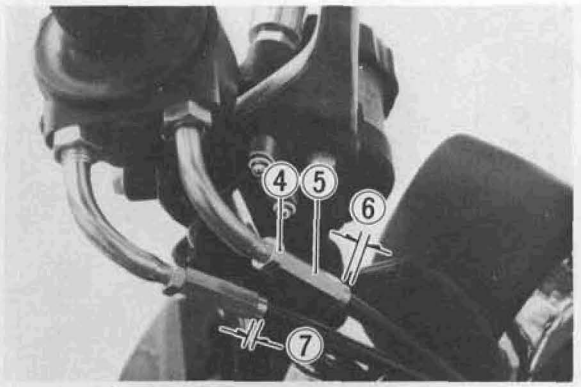


Fig. 3-33

Returning cable play

1. Reduce the play ⑦ to zero by turning the adjusting nut while holding the throttle grip fully open position, and securely tighten the lock nut.

CLUTCH

1 000	6 000	12 000	18 000	24 000 km
600	4 000	7 500	11 000	15 000 miles

CLUTCH CABLE ADJUSTMENT

Loosen lock nuts ① on the lever side of the clutch cable and screw adjust nut ② fully in on the clutch lever side.

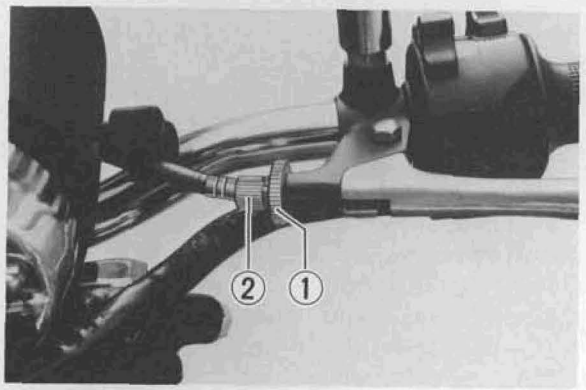


Fig. 3-34

Loosen the cable lock nut, tighten the adjust nut to provide play in the outer cable. Adjust the play of the cable with adjusting nut ② until play ① of the clutch lever is 2—3 mm (0.08—0.12 in). Next, firmly secure lock nut ③.

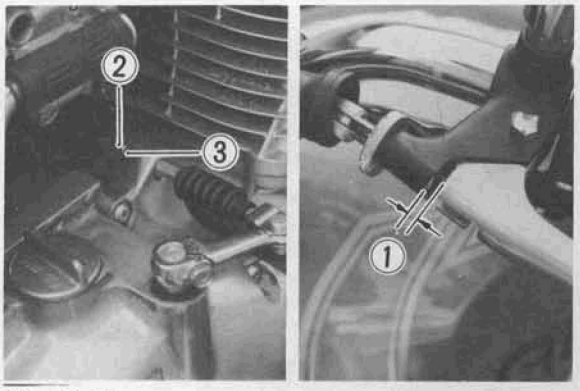


Fig. 3-35

If the specified play can not be obtained with adjusting nut ② shown in the above figure, carry out the adjustment using the adjust nut on the clutch lever side.

DRIVE SHAFT GEAR OIL

1 000	12 000	24 000 km
600	7 500	15 000 miles

Change the drive shaft gear oil in the following way. Use SAE #90 hypoid gear oil.

SECONDARY GEAR OIL

1. Keep the motorcycle erect, supporting it on the center stand.
2. Remove gear shift lever ① and secondary cover ②.
3. Drain oil by removing filler cap ③ and drain plug ④.
4. Refit drain plug ④, remove oil level screw ⑤ and pour the specified oil in through the filler hole until it runs out from the oil level hole.
5. Refit oil level screw ⑤, filler cap ③, secondary cover ② and gear shift lever ①.

NOTE:
The amount of oil to be replaced is 340—400 ml (11.5—13.5 US oz).

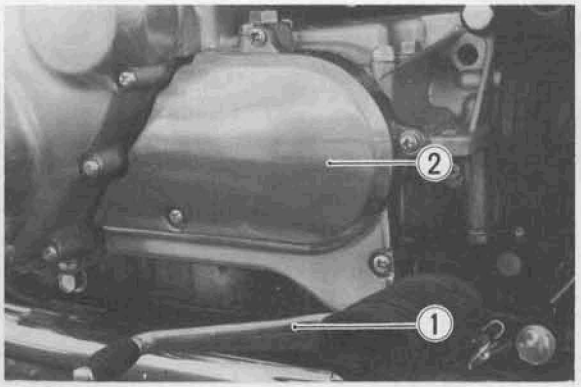


Fig. 3-36

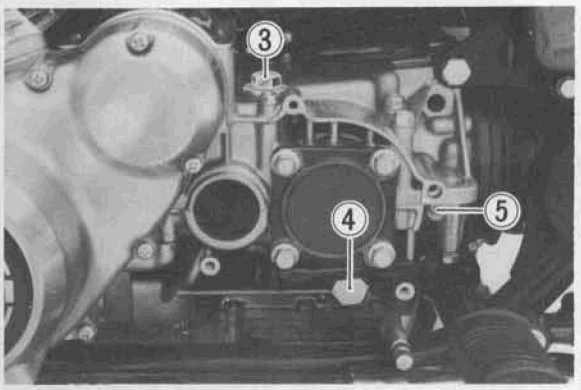


Fig. 3-37

FINAL GEAR OIL

1. Drain oil by removing filler cap ① and drain plug ②.
2. Refit drain plug ② and pour the specified oil in through the filler hole until it runs out from the filler hole.
3. Refit filler cap ①.

NOTE:
The amount of oil to be replaced is 280—330 ml (9.5—11.2 US oz).

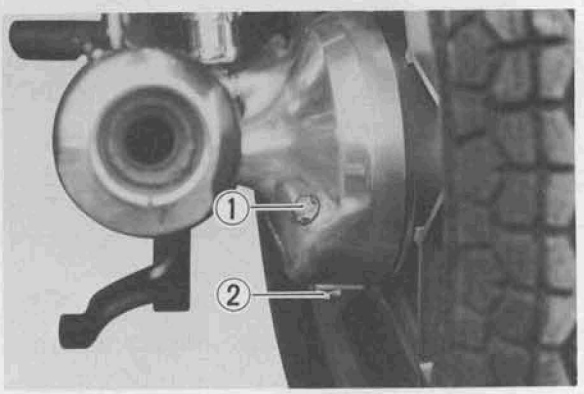


Fig. 3-38

BRAKES

1 000	6 000	12 000	18 000	24 000 km
600	4 000	7 500	11 000	15 000 miles

Check the front and rear brake systems for the following items:

1. Insufficient brake power
2. Brake squeaking
3. Excessive brake lever stroke
4. Leakage of brake fluid

If these troubles are detected, repair or replace the damaged parts as indicated in the chart below.

Symptom and possible cause	Countermeasure
INSUFFICIENT BRAKE POWER	
1) Leakage of brake fluid from hydraulic system	Repair or replace
2) Worn pads	Replace
3) Oil adhesion on engaging surface of pads	Clean disk and pads
4) Worn disk	Replace
5) Air in hydraulic system	Bleed air
BRAKE SQUEAKING	
1) Carbon adhesion on pad surface	Repair surface with sandpaper
2) Tilted pad	Modify pad fitting
3) Damaged wheel bearing	Replace
4) Loose front-wheel axle or rear-wheel axle	Tighten to specified torque
5) Worn pads	Replace
6) Foreign material in brake fluid	Replace brake fluid
7) Clogged return port of master cylinder	Disassemble and clean master cylinder
EXCESSIVE BRAKE LEVER STROKE	
1) Air in hydraulic system	Bleed air
2) Worn brake lever cam	Replace brake lever
3) Insufficient brake fluid	Replenish fluid to specified level; bleed air
4) Improper quality of brake fluid	Replace with correct fluid
LEAKAGE OF BRAKE FLUID	
1) Insufficient tightening of connection joints	Tighten to specified torque
2) Cracked hose	Replace
3) Worn piston and/or cup	Replace piston and/or cup

BRAKE HOSES AND FLUD (Replace every two years and change every year)

Replace the brake hoses with new ones. Change brake fluid every two years.

TIRES

1 000	6 000	12 000	18 000	24 000 km
600	4 000	7 500	11 000	15 000 miles

Inspect the tires for wear and damage and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with its tread worn down to the limit (in terms of tread depth) must be replaced.

Tread depth service limit	
Front	1.6 mm (0.06 in)
Rear	2.0 mm (0.08 in)

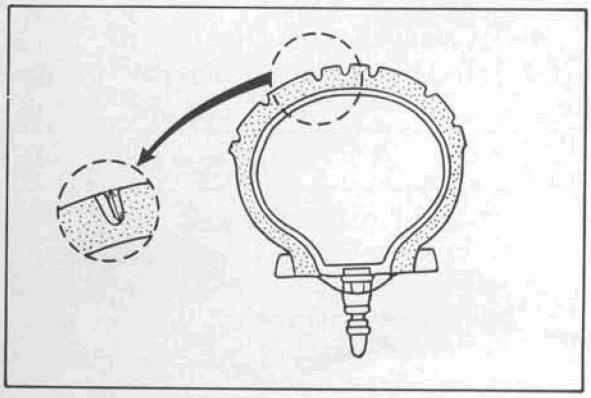


Fig. 3-39

Check the tire pressure, and examine the valve for evidence of air leakage.

COLD INFLATION TIRE PRESSURE	FRONT						REAR					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm^2	P.S.I.	kPa	kg/cm^2	P.S.I.	kPa	kg/cm^2	P.S.I.	kPa	kg/cm^2	P.S.I.
NORMAL RIDING	175	1.75	25	175	1.75	25	200	2.00	28	225	2.25	32
CONTINUOUS HIGH SPEED RIDING	200	2.00	28	200	2.00	28	225	2.25	32	280	2.80	40

STEERING

1 000 6 000 12 000 18 000 24 000 km 600 4 000 7 500 11 000 15 000 miles

Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground. With wheel straight ahead, grasp lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in section (11-19) of this manual.

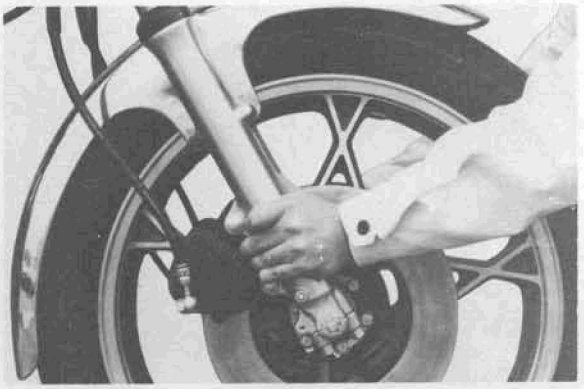


Fig. 3-40

FRONT FORKS

12 000	24 000 km
7 500	15 000 miles

Check the front fork air pressure, when the fork is cold, every 6 months in the following manner.

1) Place the motorcycle on its center stand and keep the front wheel off the ground.
2) Measure the air pressure by placing the pressure gauge on the valve as shown.

Fig. 3-41

Specified air pressure:	0.6–1.2 kg/cm² (8.5–17 psi)

3) If necessary, use a hand tire pump to raise the fork air pressure.

CAUTION:
Do not use compressed air to adjust the fork air pressure, since compressed air is stored at much higher pressures than the forks require, and seal damage may result.

NOTE:
1. *Just before charging air confirm that the valve is tight.*
2. *Try to equalize the air pressure of the two legs, right and left, as closely as possible. The maximum permissible difference is 0.1 kg/cm²* (1.4 psi).

Inspect the front fork for oil leakage, scoring and scratches on the outer surface of the inner tube every 12 000 km (7 500 miles) and replace the defective parts, if necessary.

CHASSIS NUTS AND BOLTS

1 000	6 000	12 000	18 000	24 000 km
600	4 000	7 500	11 000	15 000 miles

The nuts and bolts listed below are important safety parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 3-19 for the locations of the following nuts and bolts on the motorcycle.)

1) Handlebar clamp bolt	1.2—2.0 kg-m (8.5—14.5 lb-ft)
2) Front fork upper bracket rear bolt	1.5—2.5 kg-m (11.0—18.0 lb-ft)
3) Front fork upper bracket bolt (R and L)	2.0—3.0 kg-m (14.5—21.5 lb-ft)
4) Steering stem head bolt	3.5—5.0 kg-m (25.5—36.0 lb-ft)
5) Brake hose union bolt	1.3—1.8 kg-m (9.5—13.0 lb-ft)
6) Master cylinder bolt	0.5—0.8 kg-m (3.5—6.0 lb-ft)
7) Front fork lower bracket bolt (R and L)	1.5—2.5 kg-m (11.0—18.0 lb-ft)
8) Caliper bleeder bolt	0.6—0.9 kg-m (4.5—6.5 lb-ft)
9) Caliper bolt	2.5—4.0 kg-m (18.0—29.0 lb-ft)
10) Rear torque link nut	2.0—3.0 kg-m (14.5—21.5 lb-ft)
11) Rear shock absorber nut	2.0—3.0 kg-m (14.5—21.5 lb-ft)
12) Rear axle nut	8.5—11.5 kg-m (61.5—83.0 lb-ft)
13) Swinging arm bearing holder bolt	0.35—0.45 kg-m (2.53—3.25 lb-ft)
14) Swinging arm bearing adjustment lock nut	11.0—13.0 kg-m (79.5—94.0 lb-ft)
15) Disc bolt	1.5—2.5 kg-m (11.0—18.0 lb-ft)
16) Front axle holder nut	1.5—2.5 kg-m (11.0—18.0 lb-ft)
17) Front axle nut	3.6—5.2 kg-m (26.0—37.5 lb-ft)
18) Final gearcase nut	3.5—5.0 kg-m (25.5—36.0 lb-ft)

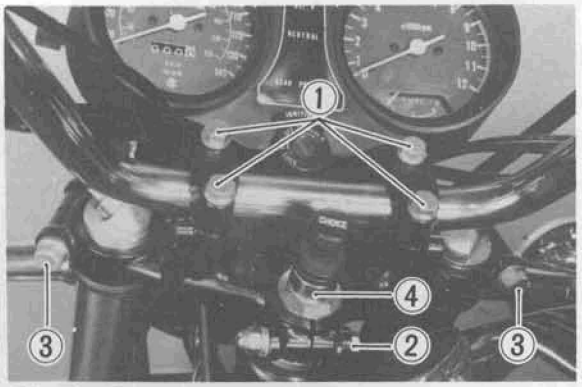


Fig. 3-42

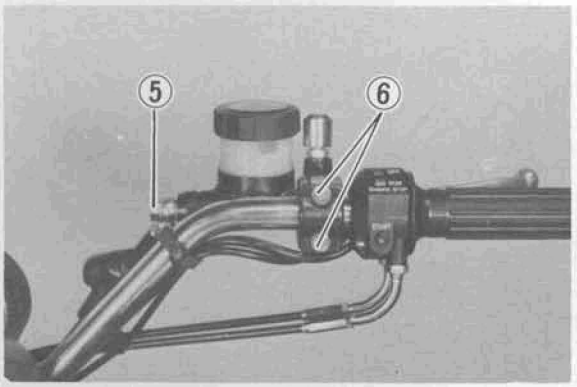


Fig. 3-43

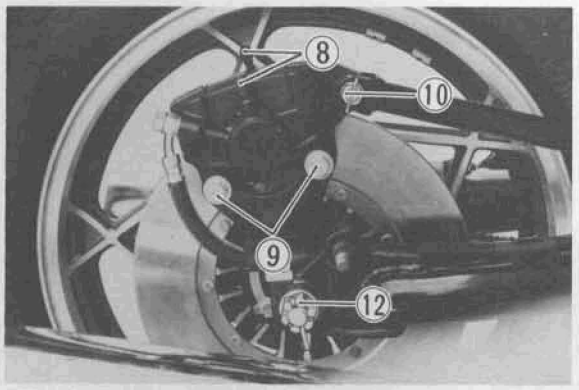


Fig. 3-44

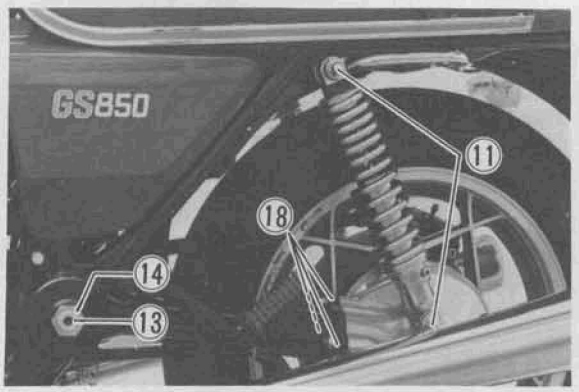


Fig. 3-45

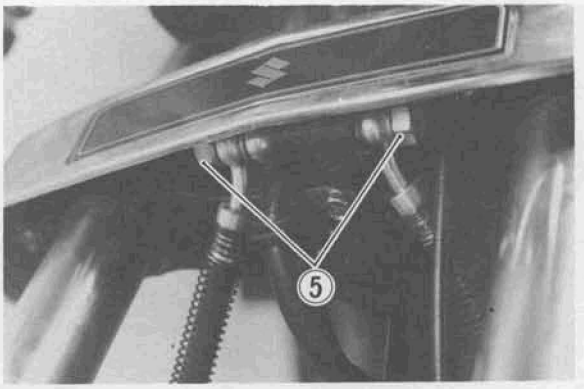


Fig. 3-46

Fig. 3-47

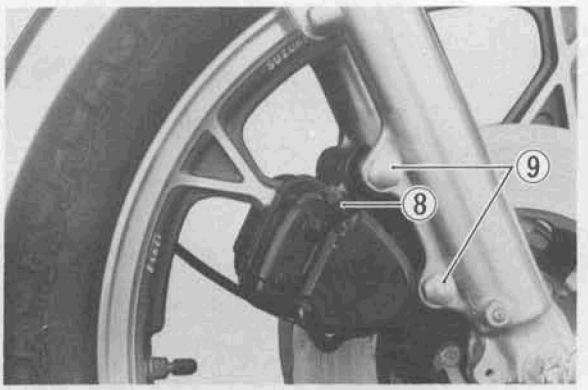


Fig. 3-48

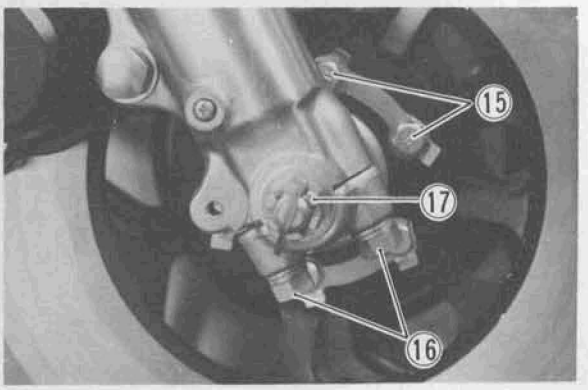
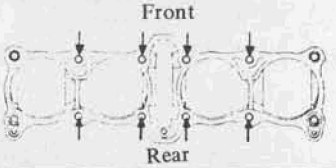


Fig. 3-49

SPECIAL MATERIALS

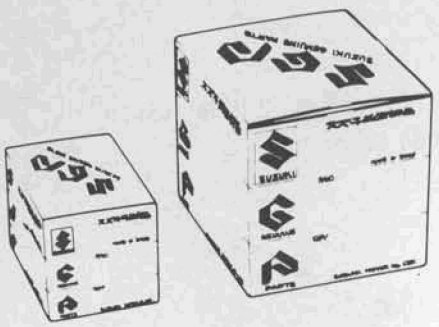
The materials listed below are needed for maintenance work on the GS850G, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

PART NO. & NAME	PART	SEE PAGE
 SUZUKI THREAD LOCK CEMENT 99000-32040	● Oil filter cap nut . . . . . 3 pcs ● Carburetor bracket screw . . . . . 8 pcs ● Camshaft end cap screw . . . . . 8 pcs ● Front fork allen bolt . . . . . 2 pcs	3–12 9–7
 THREAD LOCK "1342" 99000-32050	● Gearshift cam guide screw. . . . . 2 pcs ● Gearshift pawl screw . . . . . 2 pcs ● Countershaft B/g retainer screw . . . . . 3 pcs ● Drive shaft plate screw . . . . . 3 pcs ● Generator stator screw . . . . . 3 pcs ● Generator lead wire guide screw. . . . . 3 pcs ● Engine oil pump screw . . . . . 4 pcs ● Oil gallery plate screw . . . . . 3 pcs ● Starter motor securing bolt . . . . . 2 pcs ● Secondary drive bevel gear assy set bolt . 4 pcs ● Final bevel gear bearing holder screw. . . 3 pcs ● Final bearing case bolt . . . . . 10 pcs	7–52 7–52 7–52 7–52 7–32 7–32 7–49 7–52 7–47 8–10
 THREAD LOCK SUPER "1303" 99000-32030	● Generator rotor center bolt . . . . . 1 pc	7–33
 THREAD LOCK SUPER "1333B" 99000-32020	● Cam sprocket bolt . . . . . 4 pcs ● Thread portion at secondary drive gear ● Thread postion of final drive gear ● Propeller shaft joint bolt. . . . . 4 pcs ● Rear wheel bushing stud bolt and nut . . 6 pcs ● Starter clutch allen bolt . . . . . 3 pcs ● Gearshift stopper. . . . . 1 pc ● Cam chain guide bolt . . . . . 3 pcs ● Muffler cover screw . . . . . 4 pcs	7–15 7–45 7–8 7–33
 SUZUKI BOND No "1207B" 99104-31140	● Cylinder stud bolt . . . . . 8 pcs (Apply lightly to threads of stud bolt.) ● Cam chain chamber "O" ring (between head and cylinder)  	

PART NO. & NAME	PART	SEE PAGE
 SUZUKI BOND No. 1207B 99104-31140	• Mating surfaces of upper and lower crankcase • Final gear case • Joint portion of rear swinging arm and final gear case • Front fork allen bolt . . . . . 2 pcs	7–60 8–15 8–16
 SUZUKI SILICONE GREASE 99000-25100	• Apply to the outer periphery of brake pad	11–31
 SUZUKI CALIPER AXLE GREASE 99000-25110	• Apply to caliper axle shaft	11–32
 SUZUKI MOLY PASTE 99000-25140	• Valve stem • Cam shaft journal • Chain tensioner adjuster shaft • Countershaft washer • Outer countershaft • Input cam dog	7–13 7–15 7–25 7–56 7–56 7–56

Use of Genuine Suzuki Parts.

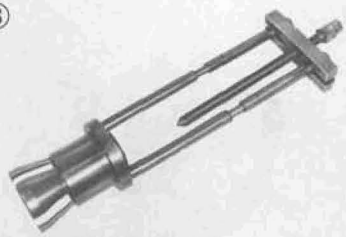
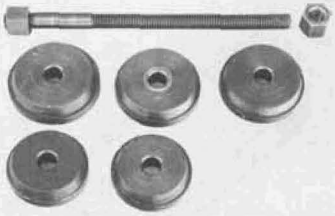
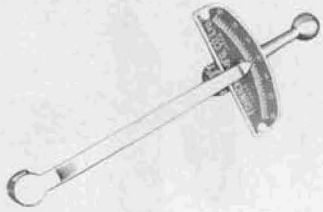
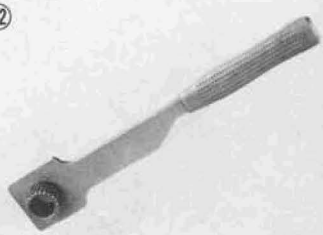
To replace any part of the machine, use a genuine SUZUKI replacement part. Imitation parts or parts supplied from any other source than SUZUKI, if used to replace SUZUKI parts, will reduce the machine's performance and, even worse, could induce costly mechanical trouble.

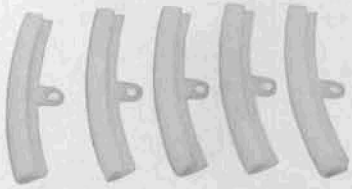
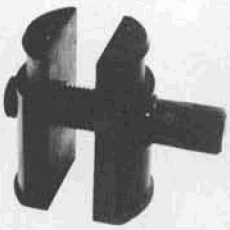
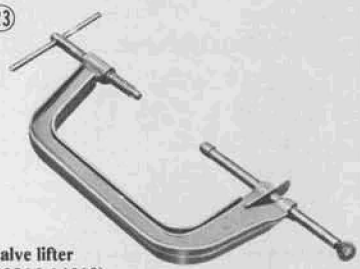
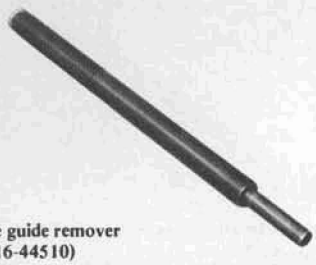
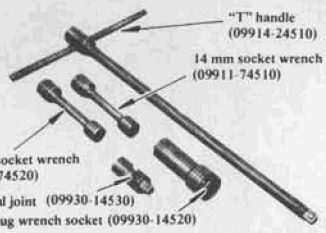
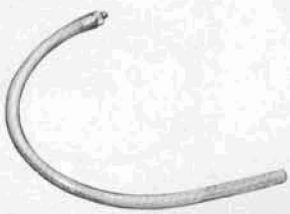


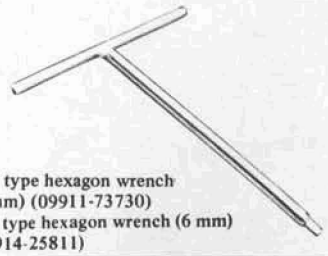
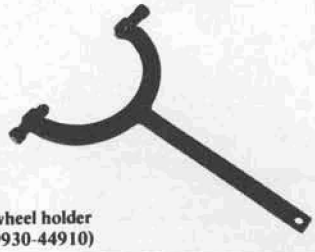
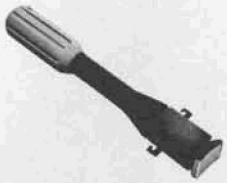
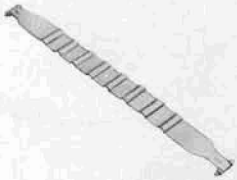
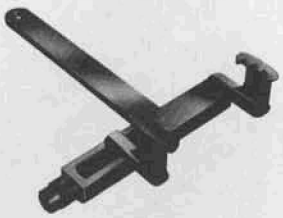
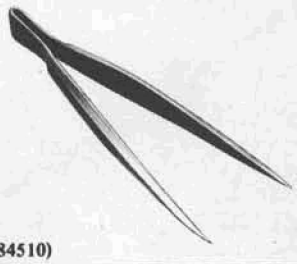
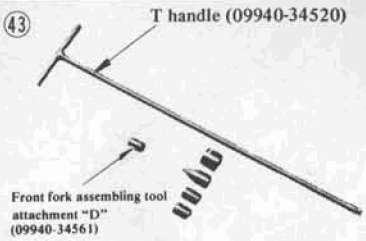
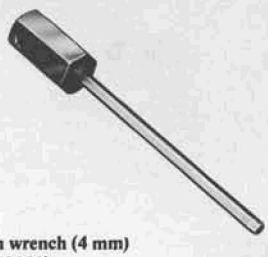
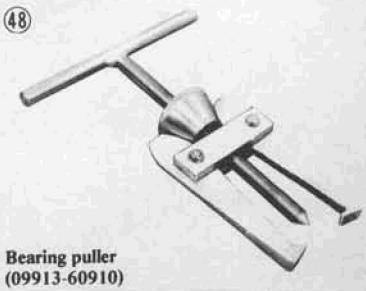
SPECIAL TOOLS

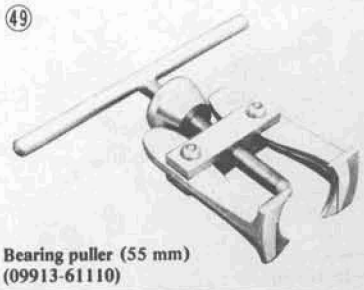
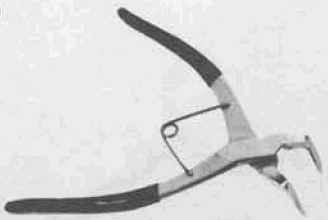
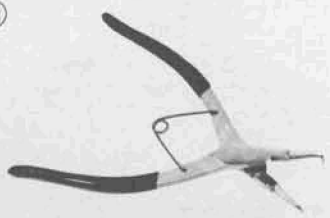
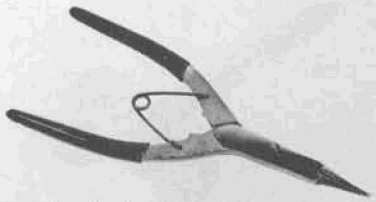
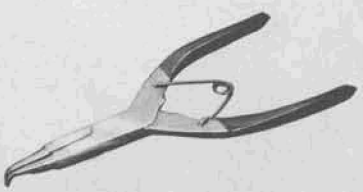
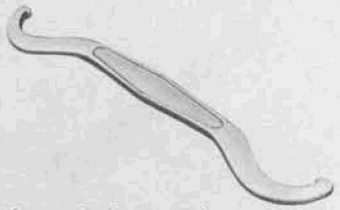
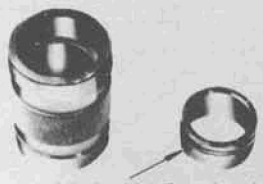
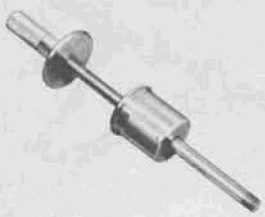
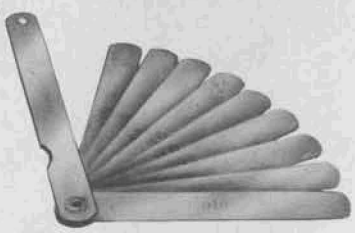
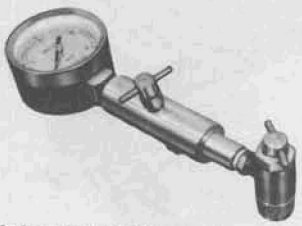
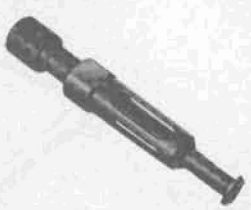
The special tools listed hereunder are designed to facilitate maintenance work—disassembly, reassembly, servicing, checking, etc.—on the GS850G, and protect the parts and components of the motorcycle against damage. Each shop is advised to keep these special tools as standard shop equipment.

NOTE:
Tools, ① through ⑳ , are newly designed special tools for the GS850G.
Tools, ㉑ through ㉛ , are special tools used exclusively for the GS series.

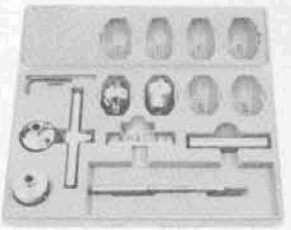
① **Secondary drive bevel gear holder** **(09924-54511)**	② **41mm socket wrench** **(09910-23710)**	③  **Bearing inner race remover** **(09941-84510)**
④ **Bearing installer** **(09913-84510)**	⑤  **Bearing installer set** **(09924-84510)**	⑥  **Torque wrench (0-15 kg-cm)** **(09900-21107)**
⑦ **Bearing and oil seal remover (30 – 45 mm)** **(09941-64510)**	⑧ **Drive pinion race installer** **(09913-80112)**	⑨ **Bearing and oil seal handle** **(09924-74510)**
⑩ **Oil seal installer and remover** **(09924-74520)**	⑪ **Final driven gear bearing installer and remover** **(09924-74570)**	⑫  **Final drive gear cupling holder** **(09924-64510)**

⑬ **Final drive bevel gear housing oil seal installer (09924-74560)**	⑭ **Final gear case oil seal installer (09924-74550)**	⑮ **Final gear case needle bearing installer (09924-94510)**
⑯ **Bearing installer (09924-74530)**	⑰ **Pilot (09924-74540)**	⑱ **Backlash measuring tool (27 – 50 mm) (09924-34510)**
⑲ **Dog cam stopper set tool (09924-44511)**	⑳  **Wheel rim protector (09941-94510)**	㉑ **Bearing and oil seal installer (09914-79610)**
㉒  **Bearing outer race remover (09941-54911)**	㉓  **Valve lifter (09916-14510)**	㉔ **Valve stem seal and valve guide installer handle (09916-57320)**
㉕ **Valve stem seal installer attachment (09911-94530)**	㉖ **Valve guide installer attachment (09916-54530)**	㉗  **Valve guide remover (09916-44510)**
㉘ **Tappet depressor (09916-64510)**	㉙  **Cylinder head nut and spark plug wrench set (09930-14511)**	㉚  **Fuel level gauge (09913-14511)**

㉛  "T" type hexagon wrench (5 mm) (09911-73730) "T" type hexagon wrench (6 mm) (09914-25811)	㉜  **Flywheel holder (*09930-44910)**	㉝ **Piston pin puller (09910-34510)**
㉞  **Piston ring holder body (09916-74521)**	㉟  **Piston ring holder band (63-75 mm) (09916-74540)**	㊱ **Carburetor throttle valve adjust wrench** (8 mm) **(09913-14520)**
㊲  **Clutch sleeve hub holder (09920-53710)**	㊳  **Forceps (09916-84510)**	㊴ **Valve guide reamer set (09916-34510)**
㊵ **Carburetor balancer (09913-13121)**	㊶ **Oil pressure gauge (09915-74510)**	㊷ **Compression gauge (09915-64510)**
㊸  **Front fork assembling tools set (09940-34512)**	㊹  **Hexagon wrench (4 mm) (09911-70130)**	㊺ **Cylinder disassembling tool (09912-34510)**
㊻ **10 mm stud bolt installing tool (09910-11510)**	㊼ **Oil seal remover** (09913-50120)	㊽  **Bearing puller (09913-60910)**

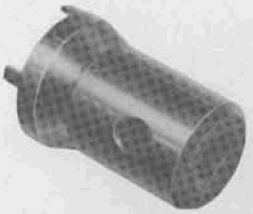
㊾  Bearing puller (55 mm) (09913-61110)	㊿  Snap ring pliers (angle closed: large size) (09900-06105)	(51)  Snap ring pliers (angle closed: small size) (09900-06106)
(52)  Snap ring pliers (straight open) (09900-06107)	(53)  Snap ring pliers (angle open) (09900-06104)	(54)  Steering stem lock nut wrench (09940-10122)
(55)  Front fork oil seal installing tool attachment (*09940-54920) Front fork oil seal installing tool (*09940-54910)	(56) Steering inner race and swing arm bearing installer (*09941-34513)	(57) Shock driver set (09900-09002)
(58) Pocket tester (09900-25002)	(59) Timing tester (09900-27003)	(60) Electro tester (09900-28106)
(61)  Rotor remover shaft set (09930-30102)	(62)  Thickness gauge (09900-20803)	(63) 8 mm hexagon wrench (09911-71510)
(64) Front fork oil level gauge (09943-74110)	(65)  Front fork pressure gauge (09940-44110)	(66)  Bearing puller (20-38 mm) (09923-74510)

⑰



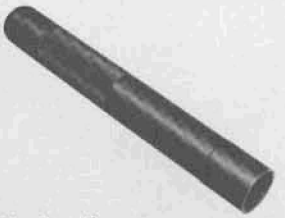
Valve seat cutterset
(99103-45011)

⑱



Steering nut socket wrench
(09940-14911)

⑲

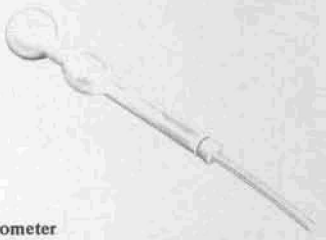


Race and bearing driver
(09941-74910)

⑳

Timing light
(09900-27311)

㉑



Hydrometer
(09900-28403)

TROUBLE SHOOTING

CONTENTS

ENGINE AND CHASSIS 6-2
ELECTRICAL 6-6

TROUBLE SHOOTING

ENGINE AND CHASSIS

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	**Compression too low**	
	1. Tappet clearance out of adjustment.	Adjust.
	2. Worn valve guides or poor seating of valves.	Repair, or replace.
	3. Valves mistiming.	Adjust.
	4. Piston rings excessively worn.	Replace.
	5. Worn-down cylinder bores.	Replace, or rebore.
	6. Starter motor cranks but too slowly.	Consult "electrical complaints".
	Plugs not sparking	
	1. Fouled spark plugs.	Clean.
	2. Wet spark plugs.	Clean and dry.
	3. Contact points dirty.	Clean.
	4. Improper gaps on contact points.	Adjust.
	5. Ignition timing out of adjustment.	Adjust.
	6. Defective ignition coil.	Replace.
	7. Open or short in high-tension cords.	Replace.
	8. Defective condenser.	Replace.
	No fuel reaching the carburetors	
	1. Clogged hole in the fuel tank cap.	Clean.
	2. Clogged or defective fuel cock.	Clean or replace.
	3. Defective carburetor float valve.	Replace.
	4. Clogged fuel pipe or suction petcock pipe.	Clean.
Engine stalls easily.	1. Fouled spark plugs.	Clean or replace
	2. Dirty contact points.	Clean or replace
	3. Ignition timing out of adjustment.	Adjust.
	4. Clogged fuel pipe.	Clean.
	5. Clogged jets in carburetors.	Clean.
	6. Tappet clearance out of adjustment.	Adjust.
Noisy engine	**Excessive tappet chatter**	
	1. Tappet clearance too large.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	Noise appears to come from pistons	
	1. Pistons or cylinders worn down.	Replace.
	2. Combustion chambers fouled with carbon.	Clean.
	3. Piston pins worn.	Repalce.
	Noise seems to come from cam chain	
	1. Stretched chain.	Replace.
	2. Worn sprockets.	Replace.
	3. Tension adjustor not working.	Repair or replace.
	Noise seems to come from clutch	
	1. Worn splines of countershaft or hub.	Replace.
	2. Worn teeth of clutch discs.	Replace.
	3. Distorted clutch discs, driven and drive.	Repair or replace.
	Noise seems to come from crankshaft	
	1. Rattling bearings due to wear.	Replace.
	2. Big-end bearings worn and rapping.	Replace.
	Noise seems to come from transmission	
	1. Gears worn or rubbing.	Replace.
	2. Badly worn splines.	Replace.
	3. Primary gears worn or rubbing.	Replace.

Complaint	Symptom and possible causes	Remedy
Slipping clutch	1. Clutch control out of adjustment or loss of play. 2. Weakened clutch springs. 3. Worn or distorted pressure plate. 4. Distorted clutch discs, driven and drive.	Adjust. Replace. Replace. Replace.
Dragging clutch	1. Clutch control out of adjustment or too much play. 2. Some clutch springs weakened while others are not. 3. Distorted pressure plate or clutch discs.	Adjust. Replace. Replace.
Transmission will not shift	1. Broken gearshift cam. 2. Distorted gearshift forks.	Replace. Replace.
Transmission shift lever will not return to position.	1. Broken return spring on shift shaft. 2. Shift shafts are rubbing or sticky.	Replace. Repair.
Transmission jumps out of gear.	1. Worn shifting gears on drive shaft or countershaft. 2. Distorted or worn gearshift forks. 3. Weakened stopper spring on gearshift cam.	Replace. Replace. Replace.
Engine idles poorly.	1. Tappet clearance out of adjustment. 2. Poor seating of valves. 3. Defective valve guides. 4. Ignition timing out of adjustment. 5. Improper gaps on contact points. 6. Spark plug gaps too wide. 7. Defective ignition coil or condenser resulting in weak sparking. 8. Float-chamber fuel level out of adjustment in carburetors.	Adjust. Replace. Replace. Adjust. Adjust. Repair. Replace. Adjust.
Engine runs poorly in high-speed range.	1. Valve springs weakened. 2. Valve timing out of adjustment. 3. Spark plug gaps too narrow. 4. Ignition not advanced sufficiently due to poorly working advancer. 5. Weakened springs on breaker arms. 6. Defective ignition coil. 7. Float-chamber fuel level too low. 8. Clogged air cleaner element. 9. Clogged fuel pipe, resulting in inadequate fuel supply to carburetors. 10. Clogged suction cock pipe.	Replace. Adjust. Repair. Repair. Replace. Replace. Adjust. Clean. Clean, and prime. Clean.
Dirty or heavy exhaust smoke.	1. Too much lube oil in the engine. 2. Worn piston rings or cylinders. 3. Worn valve guides. 4. Cylinder walls scored or scuffed. 5. Worn valves stems. 6. Defective stem seal.	Check with level gauge; drain out excess oil. Replace. Replace. Replace. Replace. Replace.
Engine lacks power.	1. Loss of tappet clearance. 2. Weakened valve springs. 3. Valve timing out of adjustment. 4. Worn piston rings or cylinders. 5. Poor seating of valves. 6. Ignition timing out of adjustment. 7. Improper gaps on contact points. 8. Spark plug gaps incorrect. 9. Clogged jets in carburetors.	Adjust. Replace. Adjust. Replace. Repair. Adjust. Adjust. Repair. Clean.

Complaint	Symptom and possible causes	Remedy
Engine lacks power.	10. Float-chamber fuel level out of adjustment. 11. Clogged air cleaner element. 12. Carburetor balancing screw loose. 13. Too much engine lube oil.	Adjust. Clean. Retighten. Drain out excess oil.
Engine overheats.	1. Heavy carbon deposit on piston crowns. 2. Not enough oil in the engine. 3. Defective oil pump or clogged oil circuit. 4. Fuel level too low in float chambers. 5. Ignition timing excessively retarded, accompanied by pinging.	Clean. Add oil Repair or clean. Adjust. Adjust.
Noisy shaft drive	**Noise seems to come from secondary bevel gear and final bevel gear assemblies.** 1. Oil level too low. 2. Excessive backlash 3. Improper tooth contact 4. Damage to bearings **Noise seems to come from propeller shaft area.** 1. Propeller shaft joint bolts loose. 2. Propeller shaft splines damaged or worn. 3. Insufficient lubricant	 Refill Adjust Adjust Replace Retighten Replace Refill
No power transmitted from engine to rear wheel	1. Broken propeller shaft 2. Broken gear teeth	Replace Replace
Secondary bevel gear and final bevel gear assemblies oil leak	1. Damage to oil seals 2. Damage to O rings.	Replace Replace
Handling-feels too heavy.	1. Steering stem nut overtightened. 2. Broken bearing in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires. 5. Insufficient air pressure in front suspension.	Adjust. Replace. Replace. Adjust. Adjust.
Wobbly handling	1. Loss of balance between right and left suspension. 2. Distorted front fork. 3. Distorted front axle or cocked tire. 4. Insufficient air pressure in front suspension.	Replace. Repair or replace. Replace. Adjust.
Wobbly front wheel	1. Distorted wheel rim. 2. Worn-down front wheel bearings. 3. Defective or incorrect tire. 4. Loose nut on axle.	Replace. Replace. Replace. Retighten.
Front suspension too soft	1. Weakened springs. 2. Not enough fork oil. 3. Insufficient air pressure in front suspension.	Replace. Refill. Adjust.

Complaint	Symptom and possible causes	Remedy
Front suspension too stiff	1. Fork oil too viscous. 2. Too much fork oil. 3. Excessive air pressure in front suspension.	Replace. Remove excess oil. Adjust.
Noisy front suspension	1. Not enough fork oil. 2. Loose nuts on suspension.	Refill. Retighten.
Wobbly rear wheel	1. Distorted wheel rim. 2. Worn-down rear wheel bearings. 3. Defective or incorrect tire.	Replace. Replace. Replace.
Rear suspension too soft	1. Weakened springs. 2. Rear suspension adjustors improperly set.	Replace. Adjust.
Rear suspension too stiff	Rear suspension adjustors improperly set.	Adjust.
Noisy rear suspension	Loose nuts on suspension.	Retighten.
Poor braking (FRONT or REAR)	1. Not enough brake fluid in the reservoir. 2. Air trapped in brake fluid circuit. 3. Pads or linings worn down.	Refill to level mark. Bleed air out. Replace.

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking	1. Defective ignition coil. 2. Defective spark plugs.	Replace. Replace.
Contact points burn or pit prematurely.	Defective condenser.	Replace.
Spark plugs soon become fouled with carbon.	1. Mixture too rich. 2. Idling speed set too high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold.	Adjust carburetors. Adjust carburetors. Change. Clean. Repalce by hot type plugs.
Spark plugs become fouled too soon.	1. Worn piston rings. 2. Pistons or cylinders worn. 3. Excessive clearance of valve stems in valve guides.	Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Spark plugs too hot. 2. The engine overheats. 3. Ignition timing out of adjustment. 4. Spark plugs loose. 5. Mixture too lean.	Replace by cold type plugs. Tune up. Adjust. Retighten. Adjust carburetors.
Generator does not charge.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Silicon diodes punctured. 4. Shorted regulator/rectifier lead wire.	Repair or replace or retighten. Replace. Replace. Repair or replace.
Generator does charge, but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of generator. 3. Defective silicon diodes. 4. Defective regulator/rectifier 5. Not enough electrolyte in the battery. 6. Defective cell plates in the battery.	Repair, or retighten. Replace. Replace. Replace. Add distilled water to raise its level. Replace the battery.
Generator overcharges.	Internal short-circuit in the battery.	Replace the battery.
Unstable charging	1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Generator internally shorted. 3. Defective regulator/rectifier.	Repair or replace. Replace. Replace.
Starter button is not effective.	1. Battery run down. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor.	Recharge or replace. Replace. Repair or replace.
Battery "sulfation"	1. Charging rate too low or too high. (When not in use batteries should be recharged at least once a month to avoid sulfation.)	Replace the battery.

Complaint	Symptom and possible causes	Remedy
Battery "Sulfation"	2. Battery electrolyte excessive or insufficient, or its specific gravity too high or too low.	Keep the electrolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions.
	3. The battery left unused for too long (especially in cold climates).	Replace the battery, if badly sulfated.
Battery discharges too rapidly.	1. Dirty container top and sides. 2. Impurities in the electrolyte or electrolyte S.G. is too high.	Clean. Change the electrolyte by consulting the battery maker's directions.

ENGINE

CONTENTS

ENGINE REMOVAL 7- 5
ENGINE REMOUNTING 7- 8
COMPRESSION CHECK 7- 9
TOP END—REMOVAL 7- 9
CYLINDER HEAD COVER 7- 9
CHAIN TENSION ADJUSTER 7- 9
CAM CHAIN IDLER 7-10
TACHOMETER DRIVE GEAR 7-10
CAMSHAFT 7-10
CYLINDER HEAD 7-10
VALVE GUIDE SERVICE 7-11
VALVE REMOVAL 7-11
VALVE GUIDE REPLACEMENT 7-11
VALVE GUIDE HOLE REAMING 7-12
VALVE GUIDE 7-12
VALVE STEM SEAL 7-12
VALVES 7-13
VALVE SPRINGS 7-13
VALVE COTTER TO VALVE STEM 7-13
CYLINDER HEAD INSTALLATION 7-14
CYLINDER HEAD 7-14
SPROCKETS ON CAMSHAFTS 7-14
POSITIONING CAMSHAFT IN PLACE 7-15
CAM BEARING CAPS 7-17
CAM CHAIN IDLER 7-17
CAM CHAIN TENSIONER ADJUSTER 7-17
TENSIONING ACTION CHECK 7-18
TAPPET CLEARANCE ADJUSTMENT 7-19
TOP END—INSPECTION 7-19
CAMSHAFT WEAR 7-19
CAMSHAFT JOURNAL WEAR 7-20
CAMSHAFT RUNOUT 7-20
CAM CHAIN 20 PITCH LENGTH 7-20
VALVE FACE WEAR 7-21
VALVE STEM RUNOUT 7-21
VALVE HEAD RADIAL RUNOUT 7-21
VALVE GUIDE—VALVE STEM CLEARANCE 7-21

VALVE SEAT WIDTH MEASUREMENT 7-22
VALVE SEAT SERVICING 7-22
VALVE SPRINGS 7-24
CYLINDER HEAD DISTORTION 7-24
CAM CHAIN TENSION ADJUSTER 7-24
REASSEMBLING 7-25
CYLINDER, PISTON AND RINGS 7-26
REMOVAL 7-26
INSPECTION 7-27
INSTALLATION 7-29
LOWER END 7-31
GENERATOR STATOR 7-31
GENERATOR ROTOR 7-32
CONTACT BREAKER POINTS 7-33
CONDENSER 7-33
AUTOMATIC ADVANCER FOR CONTACT BREAKER 7-34
CLUTCH 7-35
REMOVAL 7-35
INSPECTION 7-36
INSTALLATION 7-37
SECONDARY BEVEL GEAR ASSEMBLY 7-39
SECONDARY DRIVE GEAR ASSEMBLY 7-39
SECONDARY DRIVEN GEAR ASSEMBLY 7-42
SECONDARY GEAR SET CLEARANCING OPERATIONS 7-45
EXTERNAL MECHANISM FOR GEAR SHIFT 7-47
ENGINE LUBRICATION SYSTEM 7-48
OIL PUMP 7-48
OIL PUMP PRESSURE TEST 7-50
OIL FILTER 7-50
SUMP FILTER 7-51
CRANKCASE 7-52
CRANKSHAFT 7-54
TRANSMISSION 7-55
DRIVE SHAFT GEAR 7-57
KICK SHAFT 7-59
NOTES ON INSTALLATION OF TRANSMISSION GEAR AND CRANKSHAFT IN CRANKCASE 7-59

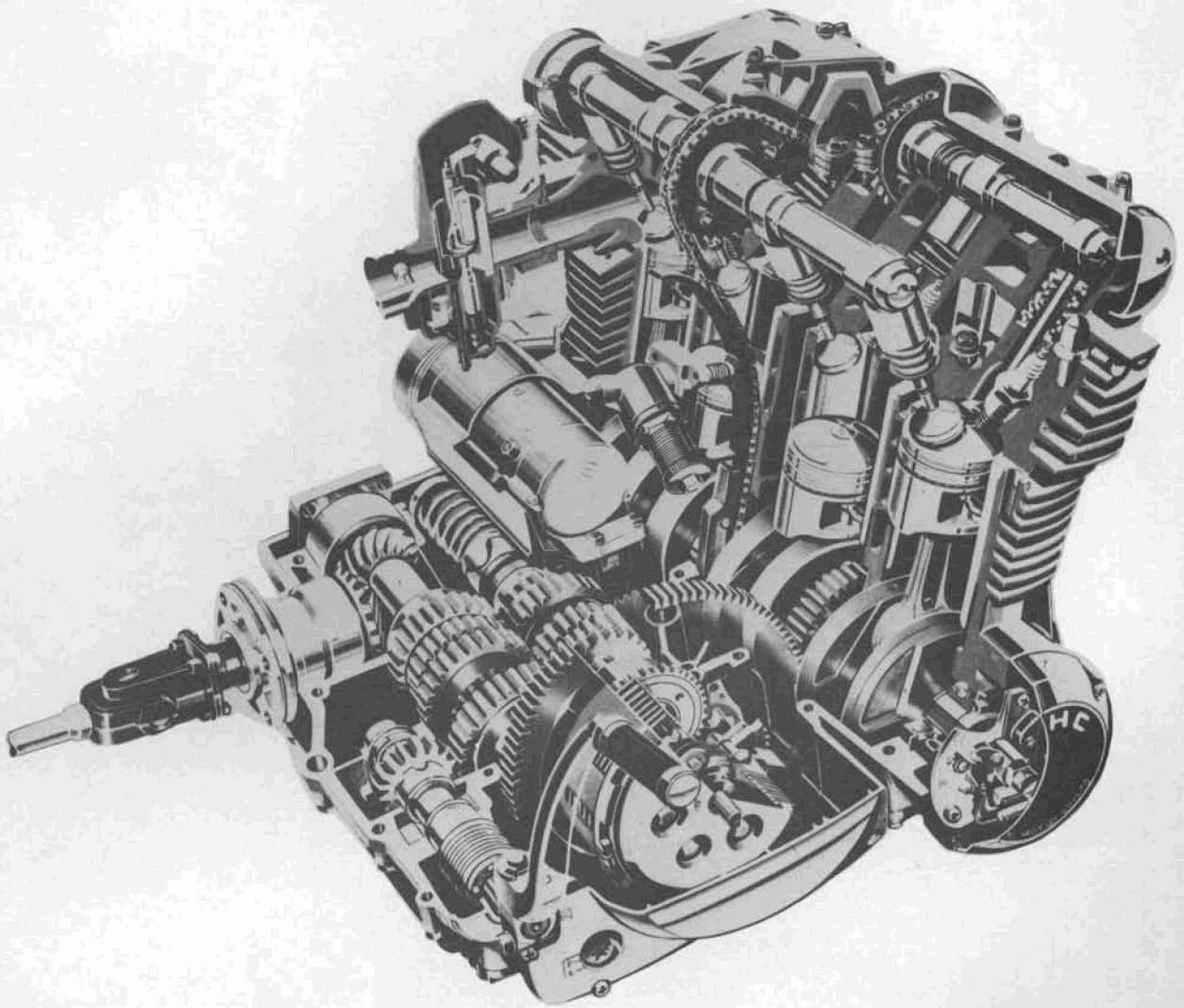


Fig. 7-1

- The parts listed below can be removed without removing the engine.
  The following sections describe the procedures for removing these parts followed by the procedure for removing the engine.

ENGINE LEFT SIDE

	See page
Generator cover	7-31
Generator rotor	7-32
Secondary drive bevel gear assembly	7-39
Gear shift lever	7-47
Gear shift switch body	7-52

ENGINE CENTER

	See page
Fuel tank	7- 5
Tachometer cable	
Carburetor and throttle cable	7- 6
Air cleaner	7- 6
Exhaust and muffler	7- 7
Horn	7- 7
Cylinder head breather cover	7- 7
Clutch cable	7- 7
Cam chain tensioner	7- 9
Cylinder head cover	7- 9
Camshaft	7-10
Cylinder head	7-10
Cylinder	7-26
Secondary driven bevel gear assembly	7-42
Oil filter	7-50
Oil pan	7-50
Sump filter	7-51
Starter motor	7-52

ENGINE RIGHT SIDE

	See page
Clutch cover	7-35
Primary drive gear	7-36
Gear shifting shaft	7-47
Oil pump ass'y	7-48
Gear shifting pawl and cam drive gear	7-60

ENGINE REMOVAL

- Place an oil pan under the engine and remove the engine oil drain plug and oil filter cap to drain off engine oil.

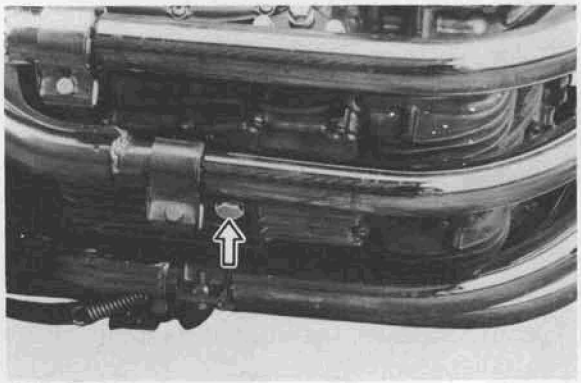


Fig. 7-2

- Place an oil pan under the secondary drive drain plug and remove the gear shifting lever and secondary drive unit cover. Next, remove the drain plug and drain off the secondary gear oil.

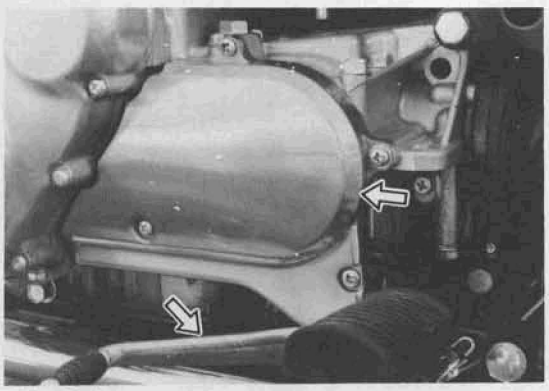


Fig. 7-3

- Set the fuel cock lever to the "ON" or "RES" position and shift the fuel pipe clip sideways to remove the two hoses from the fuel cock.
- Remove the lead wire of fuel meter sensor located at the lower left side of the fuel tank.

Fig. 7-4

- Open the seat and remove the bolt at the rear of the fuel tank. Remove the tank rearwards.

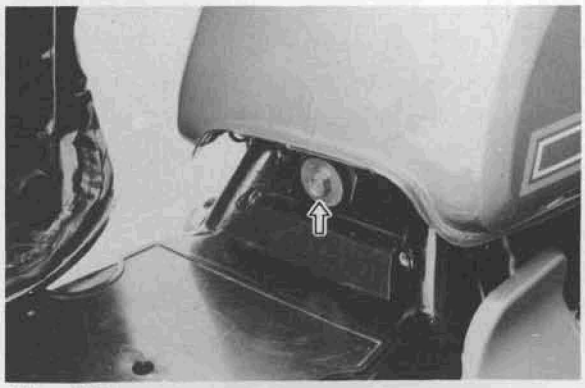


Fig. 7-5

- Move the intake pipe clamp off position and disconnect the intake pipe from the breather cover.

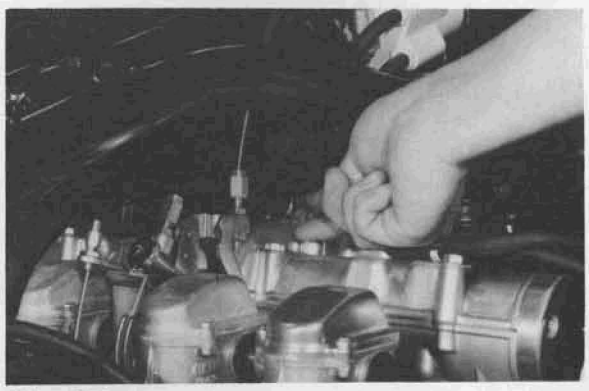


Fig. 7-6

- Remove the left and right frame side covers.
- First of all, remove the battery ⊖ terminal, then remove ⊕ terminal.
- Remove the connectors for various lead wires.
- AC generator lead wire.
- Starter relay ⊖ terminal.

- Contact point lead wire.
- Neutral switch and gear position lead wires.
- Oil pressure gauge lead wire.
- Plug cords.

Fig. 7-7

- Remove the right and left bolts ① securing the air cleaner body to the frame.
- Loosen the four air cleaner clamp screws ②, move the air cleaner a little rearward, and remove it from the carburetor. Next, remove the air cleaner to the right.

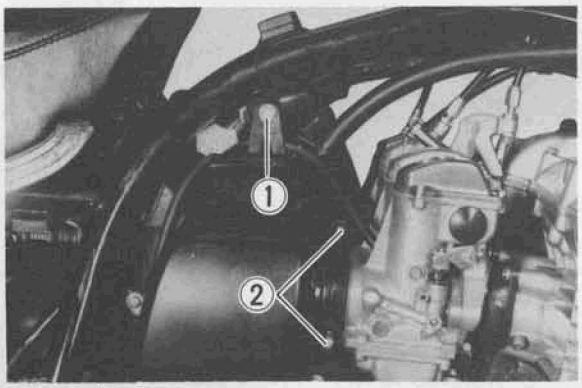


Fig. 7-8

- Loosen the throttle cable mounting nuts on the opening side ① and the closing side ② to remove the respective cables from the carburetor lever.
- Loosen the starter cable lock nut ③, and remove both inner and outer cables from the carburetor.
- Loosen the clamps for the intake manifolds and remove the carburetors by pulling toward the rear.

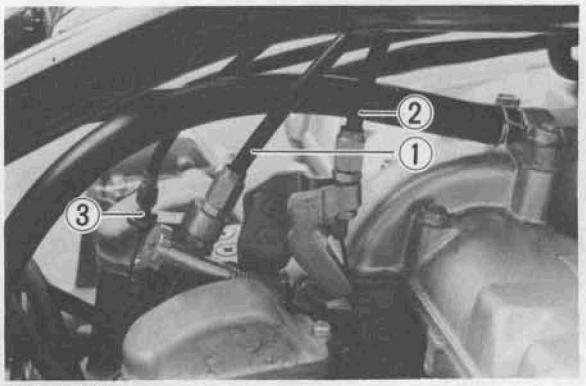


Fig. 7-9

- Loosen the clamp screw securing the propeller shaft boot, and move the propeller shaft boot rearward.

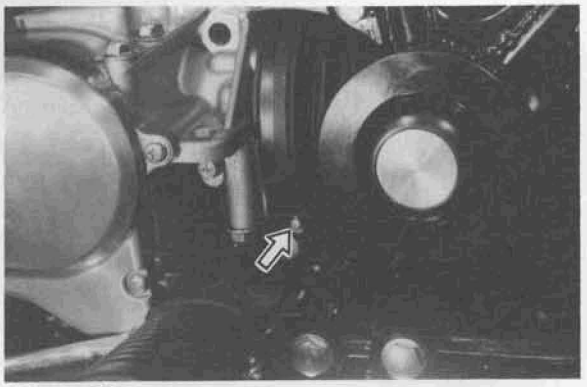


Fig. 7-10

- Remove the four bolts securing the universal joint flange and propeller shaft.

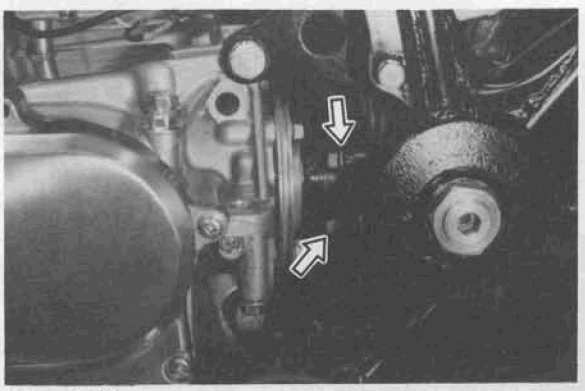


Fig. 7-11

- Remove the brake pedal mounting bolt. Next, move the pedal return spring off the peg, and remove the pedal.
- Remove the right footrest.

Fig. 7-12

- Remove the exhaust bolts, remove the right and left muffler mounting bolts, and remove the mufflers.

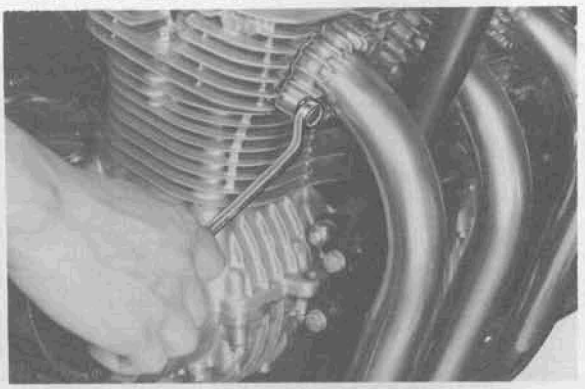


Fig. 7-13

- Remove the lead wires and mounting bolts of the horn mounting bracket, then remove the assembly.
- Fully loosen the clutch cable lock nut and adjuster bolts on the engine side. Then loosen the clutch release arm bolt and remove the clutch release arm by lifting it upward.

Fig. 7-14

- Remove the four bolts and take off the engine breather cover.

NOTE:
The frame on the upper portion of the breather cover may be damaged if the engine assembly is mounted and dismounted with the breather cover mounted on the top of the cylinder head cover.

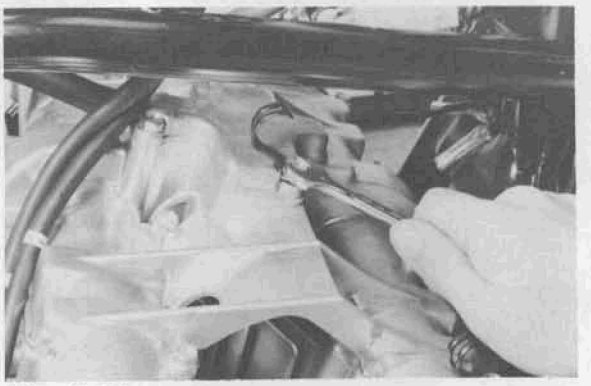


Fig. 7-15

- Support the weight of engine with a jack or stand and remove the engine mounting bolts and nuts.
- Remove all of the bolt-on engine mounting brackets (4).

Right side

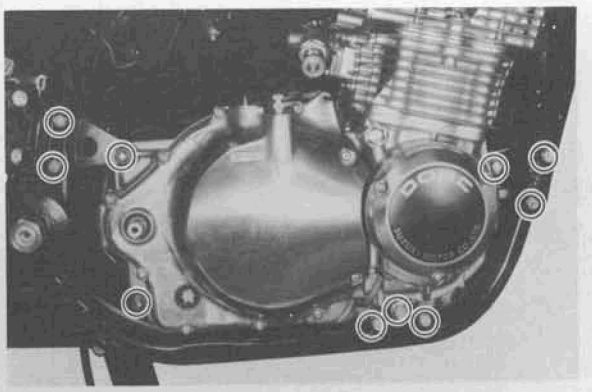


Fig. 7-16

Left side

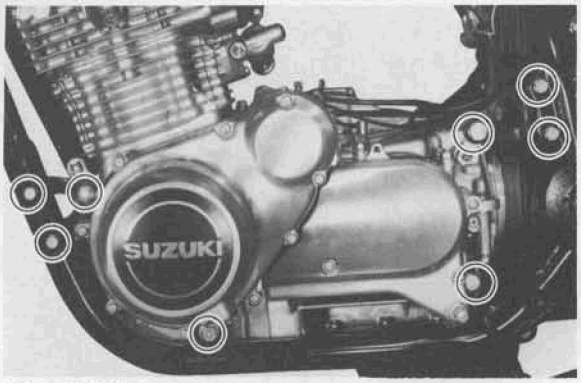


Fig. 7-17

- Lift the engine up and out the right side of the frame: be careful not to scar the upper or lower frame tubes.

Fig. 7-18

ENGINE REMOUNTING

For remounting, reverse the order of engine removal.

- Temporarily fasten the engine mounting bracket before inserting the engine mounting bolts.
- After inserting the engine mounting bolts, tighten engine mounting bracket bolts and engine mounting bolts. Insert all three long bolts from the left side.

Tightening torque for engine mounting bolts	
10 mm Dia.	3.5 kg-m (25.5 lb-ft)
8 mm Dia.	2.5 kg-m (18.0 lb-ft)

- Secure the universal joint flange and propeller shaft with four bolts at four places. Be sure to apply SUZUKI LOCK SUPER "1333B" to the bolts.

Bolt tightening torque:	2.5—3.0 kg-m (18.0—21.5 lb-ft)

- Install the propeller shaft boot with the clamp (front side) and spring (rear side).
- Firmly secure the carburetor with the clamps. If the carburetor is not firmly secured, gas leakage, incorrect air-fuel ratio and unsatisfactory engine operation may result.
- Before tightening the exhaust pipe bolts, install both right and left muffler mounting bolts loosely.
- After tightening the exhaust pipe bolts, tighten both right and left muffler mounting bolts.

Exhaust pipe bolt tightening torque:	0.9—1.4 kg-m (6.5—10.0 lb-ft)

Muffler bolt tightening torque:	1.8—2.8 kg-m (13.0—20.0 lb-ft)

- Replace the plug caps on the spark plugs so that their code markings correspond to the cylinder numbers arranged in the order of 1, 2, 3, and 4 from the left.

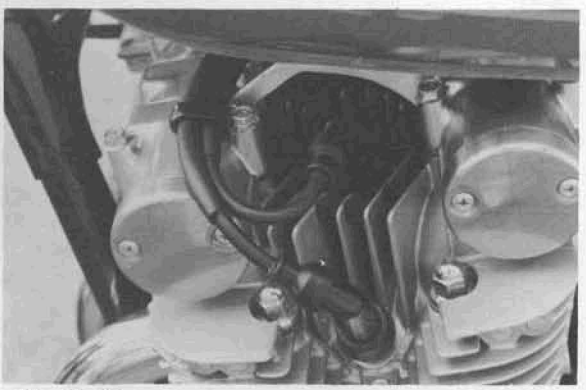


Fig. 7-19

- After remounting the engine, adjust the rear brake pedal (page 11-33), brake light switch, clutch (page 3-13) and throttle cable (page 3-13).
- Before starting the engine, make sure the amount of oil required, according to the type of work done, has been put in. Refer to page 2-8 for quantities.

COMPRESSION CHECK

The compression of a cylinder is a good indicator of its internal condition. The decision to overhaul the cylinders is often based on the results of a compression test. Periodic maintenance records kept at your dealership should include compression readings for each maintenance service.

Compression

Standard	Limit	Difference
9–12 kg/cm² (128–171 psi)	7 kg/cm² (100 psi)	2 kg/cm² (28 psi)

Low compression pressure can indicate any of the following conditions:

- Excessively worn cylinder wall
- Worn-down piston or piston rings
- Piston rings stuck in the grooves
- Poor sealing of valves
- Ruptured or otherwise defective cylinder head gasket
- Overhaul the engine in the following cases; 1) compression pressure in any one of the cylinders is less than 7 kg/cm², 2) the difference in compression pressure between the highest and lowest measurements is more than 2 kg/cm², and 3) compression pressure in the four cylinders each is below 9 kg/cm² (standard) even when it measures more than 7 kg/cm².

Compression test procedure:

NOTE:
1) Before testing the compression of the engine, make sure that the cylinder head nuts and bolts are tightened to specification.
2) Warm up the engine before testing.

1. Remove all spark plugs.
2. Fit the compression gauge (special tool: 09915-64510) ① in one of the plug holes, while taking care that the connection is tight.
3. Twist the throttle grip full open.
4. Crank the engine a few seconds with the starter, and record the maximum gauge reading as the compression of that cylinder.
5. Repeat this procedure with the other cylinders.

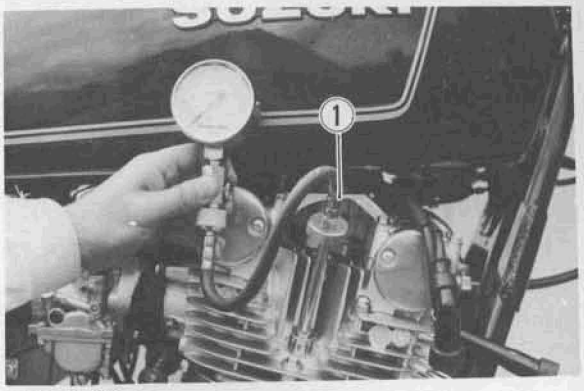


Fig. 7-20

TOP END—REMOVAL

CYLINDER HEAD COVER

Fig. 7-21

CHAIN TENSION ADJUSTER

This adjustment can be accomplished by first loosening lock nut ① and tightening screw ② and then by removing three mounting bolts ③.

NOTE:
Tightening screw ② locks the spring loaded tensioner pushrod inside.

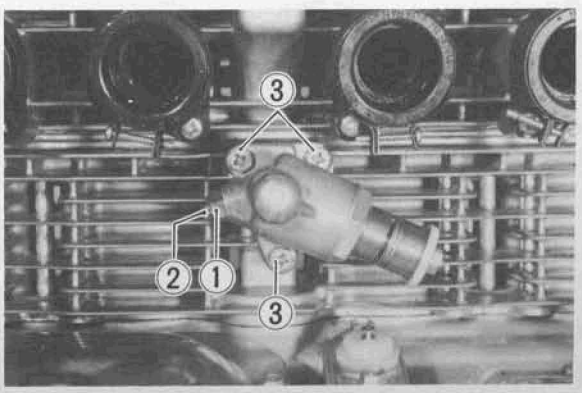


Fig. 7-22

CAM CHAIN IDLER

Remove the four bolts, and remove the cam chain idler from the cylinder head.

> *NOTE:*
> *The idler assembly is composed of several pieces, and care should be taken when removing it not to drop any pieces into the engine.*

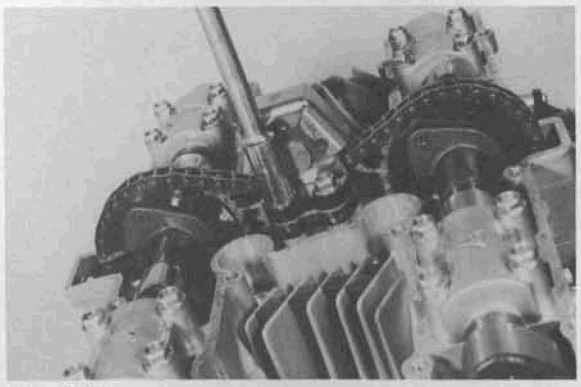


Fig. 7-23

TACHOMETER DRIVE GEAR

Remove tachometer drive gear from head by pulling the assembly out after removing its stopper (secured by a hex/phillips screw)

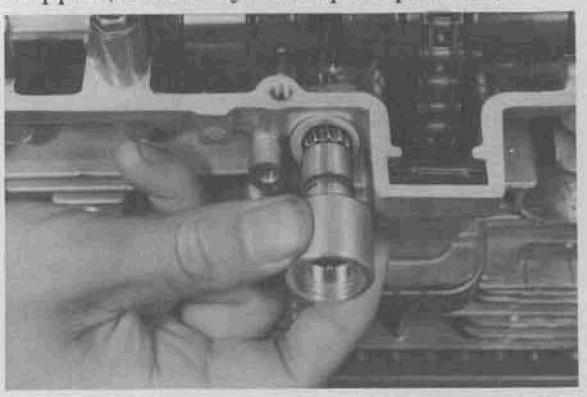


Fig. 7-24

CAMSHAFT

- To remove the camshafts, loosen the bearing cap bolts one turn at a time in a cross pattern until all valve spring pressure on the shafts is relieved. Cams can then be lifted out.

> *NOTE:*
> *Damage the cylinder head and/or cam bearing caps may be caused by the camshaft thrust shoulders if you fail to observe the above procedure.*

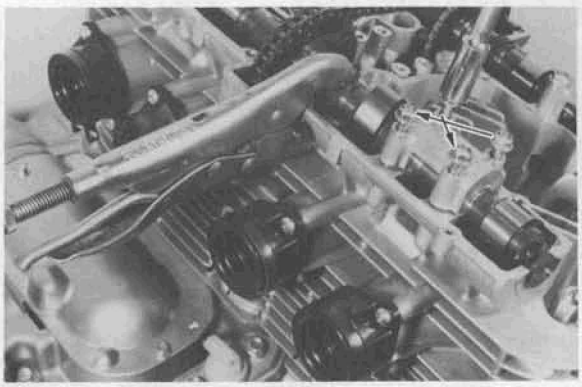


Fig. 7-25

CYLINDER HEAD

- Remove spark plugs
- Remove 2-6mm bolts next to #1 & #4 spark plug positions, 1-6mm bolt at the front of timing chain area.
- Remove 12-10mm nuts, working from #12 to #1 (numbers are cast on head next to nuts).

Socket-14 mm	09911-74510
T-handle	09914-24510

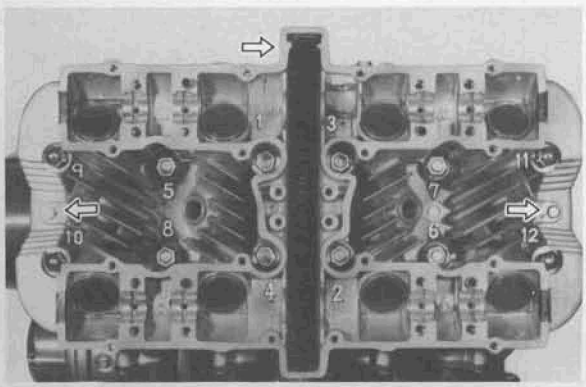


Fig. 7-26

- Remove the tappets, complete with shims, and identify each.

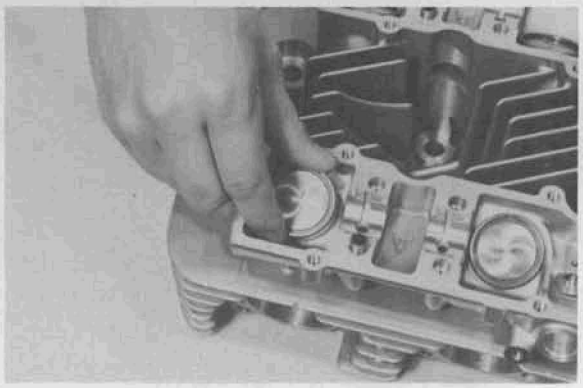


Fig. 7-27

NOTE:
Exercise caution in removing and storing tappets so as not to nick them.

VALVE GUIDE SERVICE

VALVE REMOVAL

- Remove each valve in the following manner:
  1. Using the valve lifter, compress the spring.

Valve lifter:	09916-14510

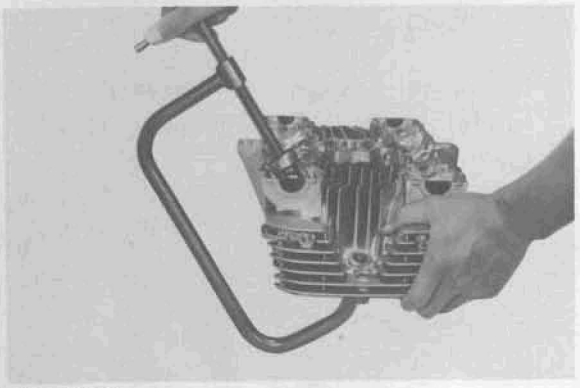


Fig. 7-28

  2. Take off the two cotter halves from the valve stem, using forceps.

Forceps	09916-84510

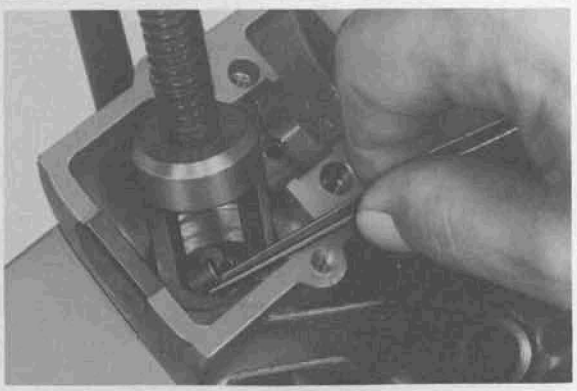


Fig. 7-29

  3. Take out the valve spring retainer, inner spring and outer spring.

Fig. 7-30

  4. From the other side, pull out the valve.

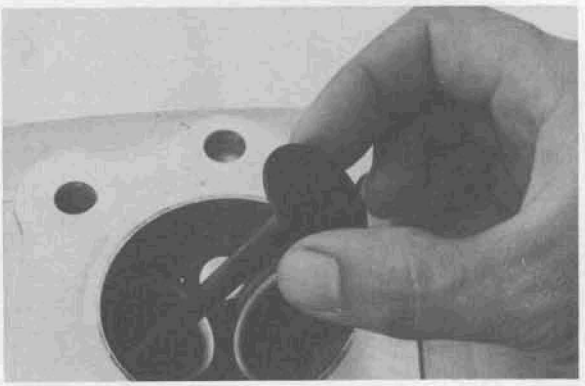


Fig. 7-31

VALVE GUIDE REPLACEMENT

Drive the valve guide out toward cylinder head side: use the valve guide remover.

Valve guide remover:	09916-44510

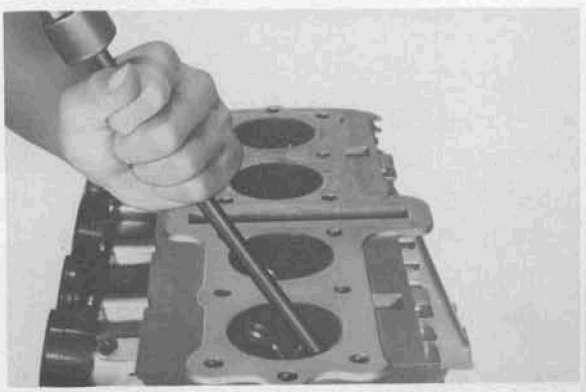


Fig. 7-32

NOTE:
Discard the removed valve guide sub-assemblies.

VALVE GUIDE HOLE REAMING

- Re-finish the valve guide holes in cylinder head with a 12.2 mm reamer ① .

12.2 mm reamer:	09916-34530

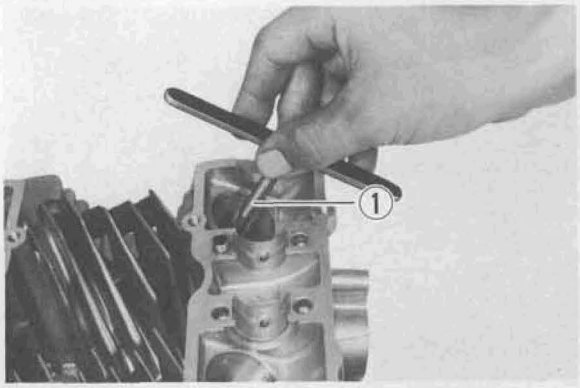


Fig. 7-33

VALVE GUIDE

- Fit a ring to each valve guide. Be sure to use new rings and valve guides. Use of rings and valve guides removed during disassembly is prohibited. Remember that the guide for intake valve ① differs in shape from that of the exhaust valve ② .

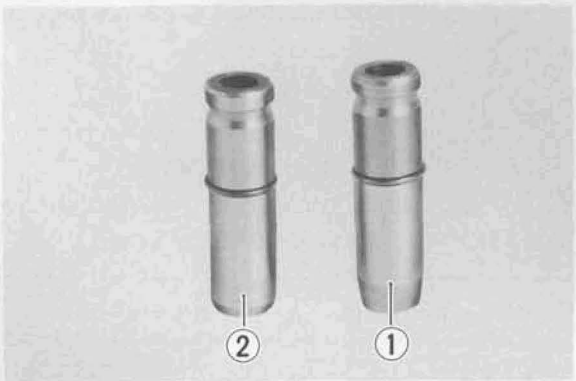


Fig. 7-34

- Oil the stem hole, in each valve guide and drive the guide into the guide hole using the valve guide and stem seal installer attachment ③. Be sure to use a valve guide installer attachment handle ④ on the pushing face of the installer, as shown, to avoid direct contact between installer and valve guide.

③	Valve guide installer attachment	09916-54530
④	Valve guide installer handle	09916-57320

CAUTION:
Failure to oil the valve guide hole before driving the new guide into place many result in a damaged guide or head.

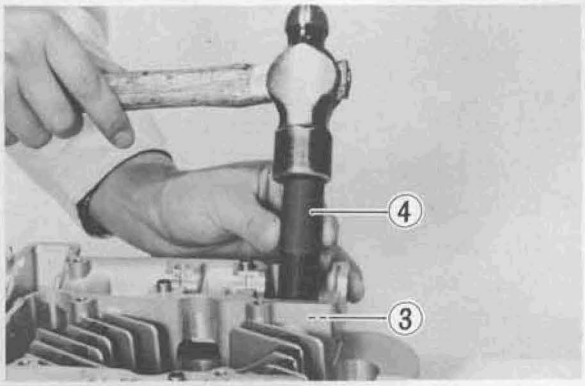


Fig. 7-35

- Install valve spring lower seats ① . Be careful not to confuse the lower seats with the spring retainer ② .

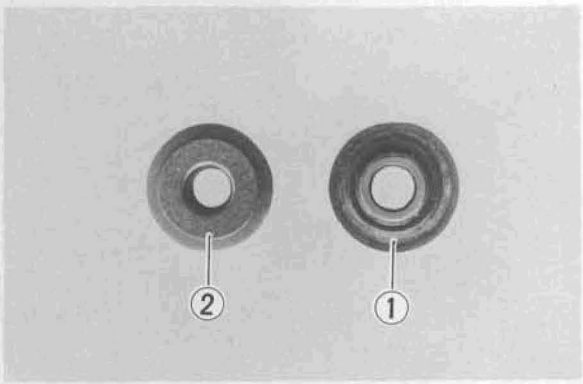


Fig. 7-36

VALVE STEM SEAL

1. Oil each oil seal, and drive them into position with the valve stem seal installer. Be sure to use a valve guide and stem seal installer attachment handle on the pushing face of the installer.

NOTE:
Do not use the oil seals removed in disassembly: use new seals.

③	Valve stem seal installer attachment	09911-94530
④	Valve stem seal installer handle	09916-57320

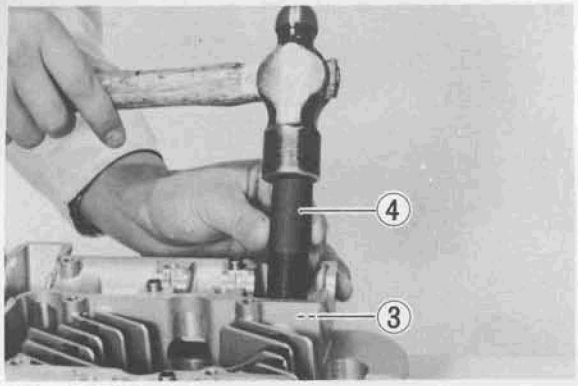


Fig. 7-37

VALVES

2. Insert the valves, with their stems coated with high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any break.

> *CAUTION:*
> *When inserting each valve, take care not to damage the lip of the stem seal.*

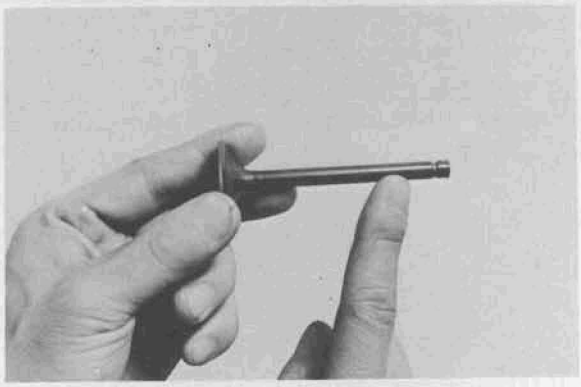


Fig. 7-38

VALVE SPRINGS

3. Position valve springs in place, making them rest on lower spring seat ① by their closed-pitch ends ②. Both springs, inner ③ and outer ④, have varied coil pitches: the coil pitch progressively becomes shorter from one end to the other. Large-pitch portions are indicated as ⑤ : small-pitch portions as ⑥.

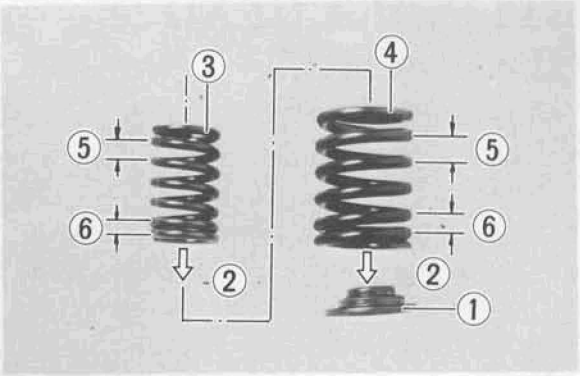


Fig. 7-39

VALVE COTTER TO VALVE STEM

4. Put on the upper valve seat and, using the valve lifter, press down the springs, fit the cotter pin to the stem end, and release the lifter to allow the cotter ① to wedge in between seat and stem. Be sure that the rounded lip ② of the cotter fits snugly into the groove ③ in the stem end.

Valve lifter	09916-14510

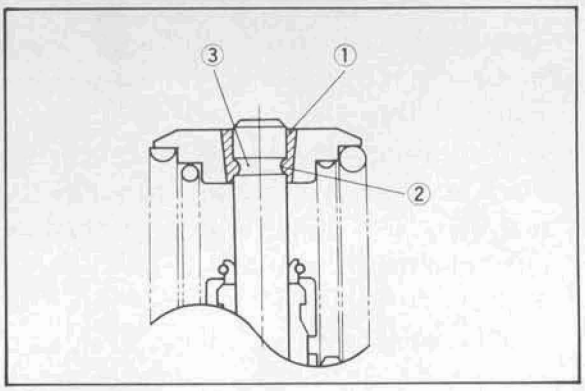


Fig. 7-40

5. Oil each valve tappet and the bore in which it slides. Push the tappet into the bore with your fingertips. Only a light force is required to push it in.

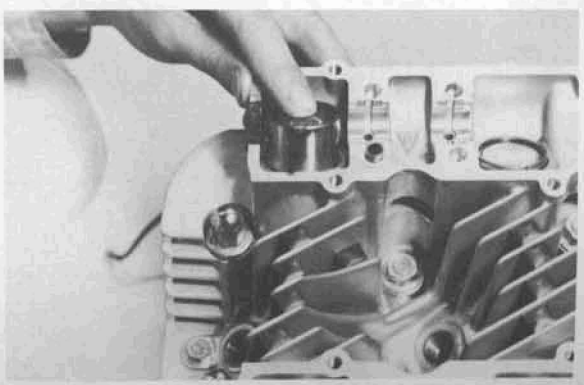


Fig. 7-41

CYLINDER HEAD INSTALLATION

CYLINDER HEAD

- Mount the head on the cylinder block as follows:
- Be sure to replace cylinder head gasket with new one to prevent gas leakage. Gasket is installed with the wider side of metal ring around cylinder opening toward the cylinder.

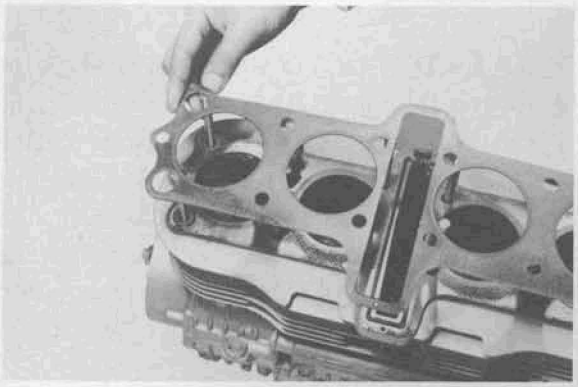


Fig. 7-42

- Install the four crown nuts and copper washers in the positions Ⓐ (oil passages) indicated. (Fig. 7-42)
- With the head snugly seated on the cylinder block, secure it by tightening the twelve 10-mm nuts sequentially in the ascending order of numbers on head.
- Tighten the twelve 10-mm nuts to specification with a torque wrench sequentially in the ascending order of numbers.

Cylinder head nut tightening torque:	3.7 kg-m (27.0 lb-ft)

- After firmly tightening the 12 nuts, insert two 6-mm bolts (indicated as Ⓑ) and tighten them to the following specification. (Fig. 7-43)

Cylinder head bolt tightening torque:	0.9 kg-m (6.5 lb-ft)

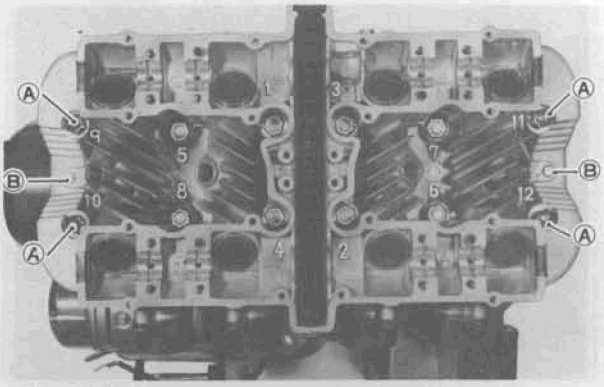


Fig. 7-43

- Install 6mm bolt at front of timing chain casting and tighten to:

Tightening torque	0.9 kg-m (6.5 lb-ft)

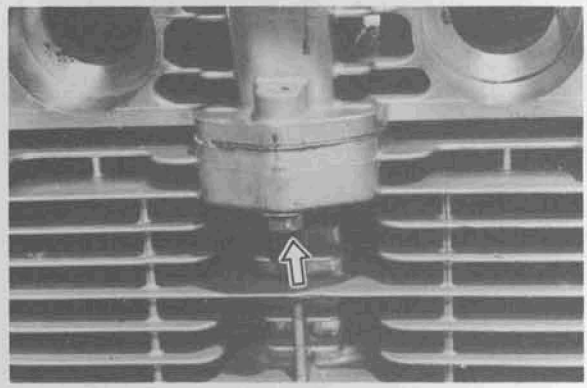


Fig. 7-44

SPROCKETS ON CAMSHAFTS

- Exhaust camshaft has its own sprocket, as does the intake camshaft. Do not confuse the two sprockets.

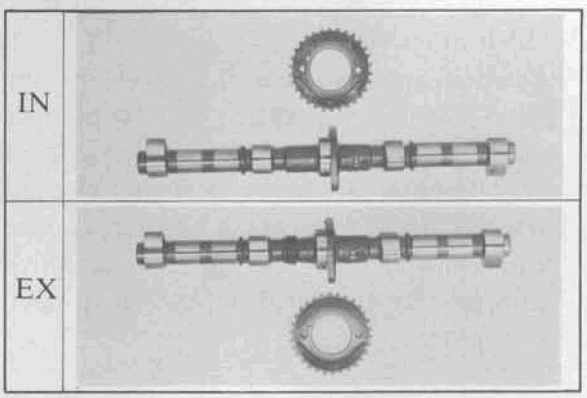


Fig. 7-45

- It is very important that each sprocket be positioned angularly on its camshaft as illustrated. Its correct position is determined by arrow mark "3" (on INTAKE sprocket) or arrow marks "1" and "2" (on EXHAUST sprocket) located (as shown) in reference to the notch ① in the camshaft end. (Fig. 7-46)
- Apply THREAD LOCK SUPER "1333B" (99000-32020) to the threads of Allen-head bolts, and tighten them to the following specification:

Camshaft sprocket bolt tightening torque:	0.8—1.1 kg-m (6.0—8.0 lb-ft)

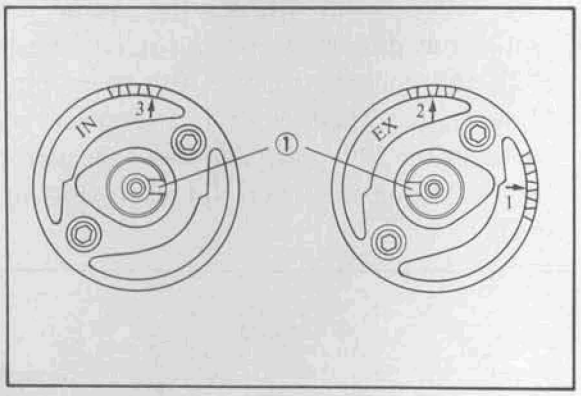


Fig. 7-46

POSITIONING CAMSHAFT IN PLACE

NOTE:
Just before placing the camshaft on the cylinder head, apply high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE: 99000-25140) to its journals, fully coating each journal with the paste taking care not to leave any dry spot. Apply engine oil to the journal bearings.

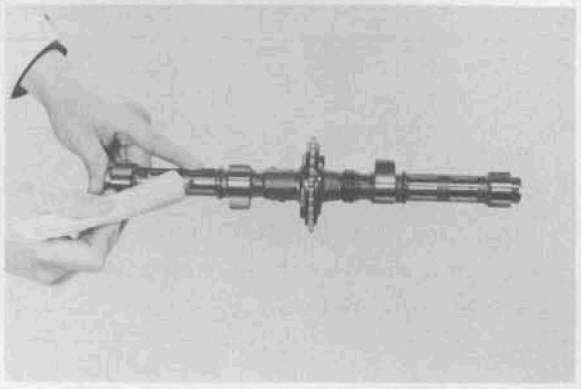


Fig. 7-47

- The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake). Similarly, the right end can be distinguished "R" from the left end "L" of each camshaft.

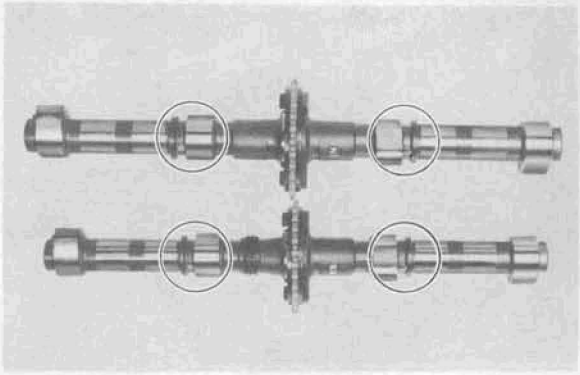


Fig. 7-48

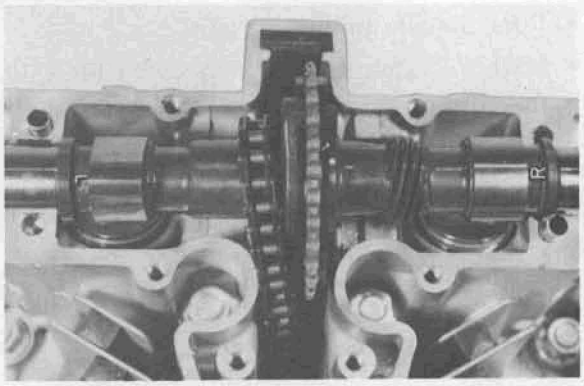


Fig. 7-49

- Pull slackout of the timing chain, and rotate the crankshaft in normal running direction to bring the "T" mark on Nos. 1 and 4 side (of the advance governor) to the timing mark. Use a 19-mm wrench to turn the crankshaft.

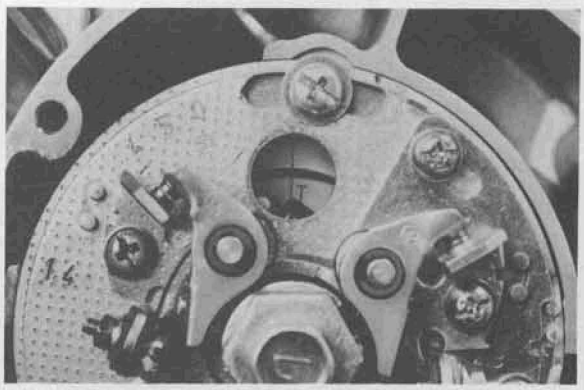


Fig. 7-50

CAUTION:
To turn over the crankshaft, turn nut ① with a 19-mm wrench. Never try to rotate the crankshaft by putting a 12-mm wrench to bolt ②.

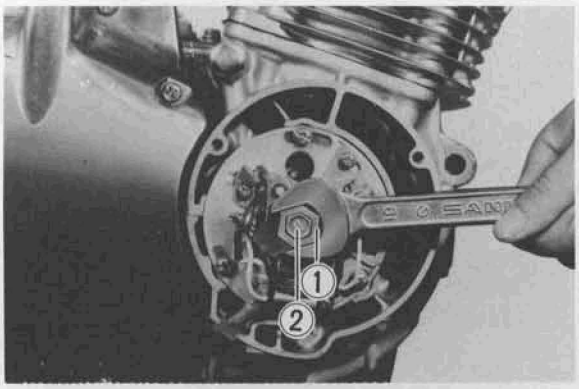


Fig. 7-51

- Put exhaust cam under chain.
- With "T" mark accurately lined up with the timing mark, hold the crankshaft steady and lightly pull up the chain to remove the slack between the crank sprocket and exhaust sprocket.
- Exhaust sprocket bears an arrow mark "1" indicated as ①. Turn over the exhaust camshaft so that the arrow points flush with the gasket surface of the cylinder head. Engage the timing chain with this sprocket. (Fig. 7-52)

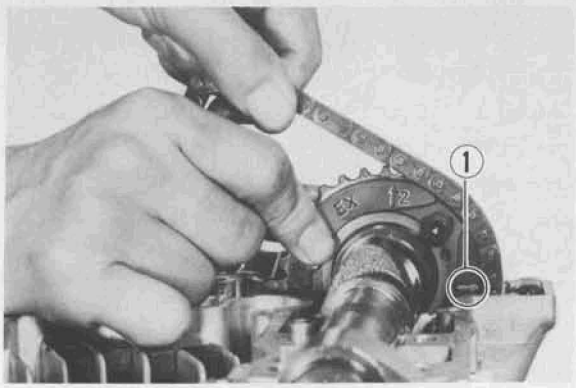


Fig. 7-52

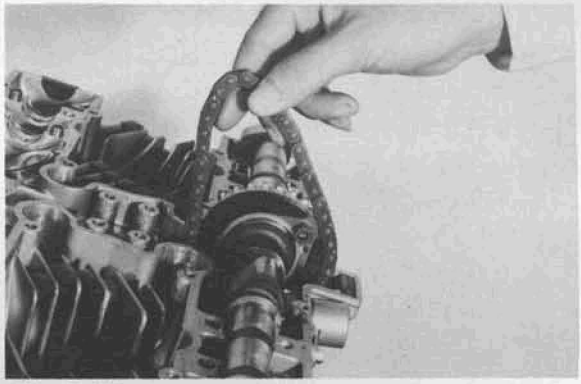


Fig. 7-53

- The other arrow mark "2" is now pointing straight upward. Put the intake cam in place and count the chain roller pins toward the intake camshaft, starting from the roller pin directly above this arrow mark "2" and ending with the 20th roller pin. Engage the chain with intake sprocket, locating the 20th pin at and above the arrow mark "3" on the intake sprocket. (Fig. 7-54)

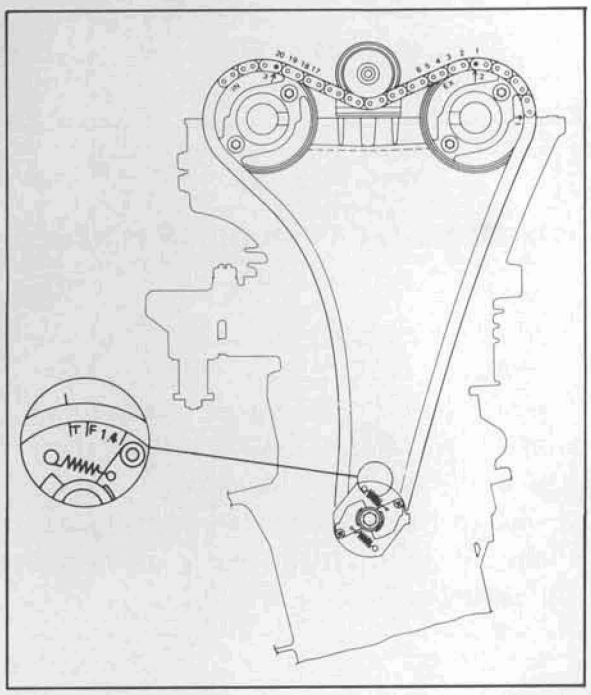


Fig. 7-54

NOTE:
The camshaft chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the four camshaft bearing caps are secured.

CAM BEARING CAPS

- Each camshaft bearing cap is identified with a cast-on letter within a triangle. A matching cast-on symbol appears on the head. Install each cap at its' matching letter, with triangle symbols pointing the same way.

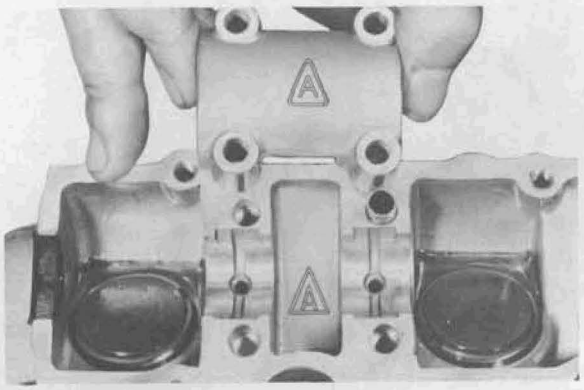


Fig. 7-55

- Secure the four camshaft bearing caps evenly by tightening the camshaft bearing cap bolts sequentially. Try to equalize the pressure by moving the wrench diagonally from one bolt to another and from one camshaft bearing cap to another, to pull shafts down evenly.

NOTE:
Damage to head or cam bearing cap thrust surfaces may result in cam bearing caps are not drawn down evenly.

- Tighten the camshaft bearing cap bolts to the following torque value:

CAUTION:
The camshaft holder bolts are made of a special material and much superior in strength compared with other type of high strength bolts.
Take special care not to use other type bolts instead of these special bolts. To identify these bolts, each of them has a figure "9" on its head.

Camshaft bearing cap bolt tightening torque:	1.0 kg-m (7.0 lb-ft)

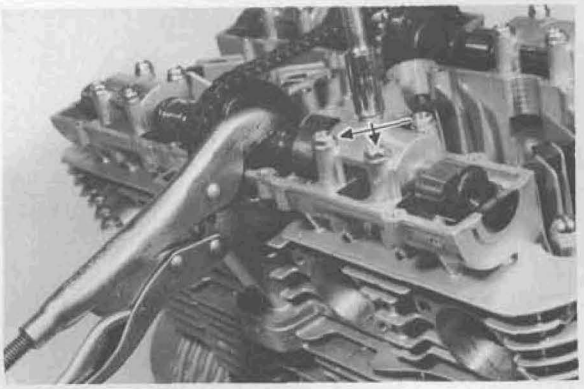


Fig. 7-56

CAM CHAIN IDLER

- Install the cam chain idler and tighten to specification. If not, the damper rubber could not serves as a chain noise absorber, and thus an excessive chain noise will result.

Chain idler tightening torque:	0.6—0.8 kg-m (4.5—6.0 lb-ft)

Fig. 7-57

CAM CHAIN TENSIONER ADJUSTER

Removal of the tension adjustor is necessary during engine disassembly and also due to removal of camshafts. In either case, re-install the adjuster on the cylinder block after the camshafts have been installed. The procedure is as follows:

- While turning knurled knob counterclockwise, push in the pushrod all the way. Keep on turning the knob until it becomes tight.

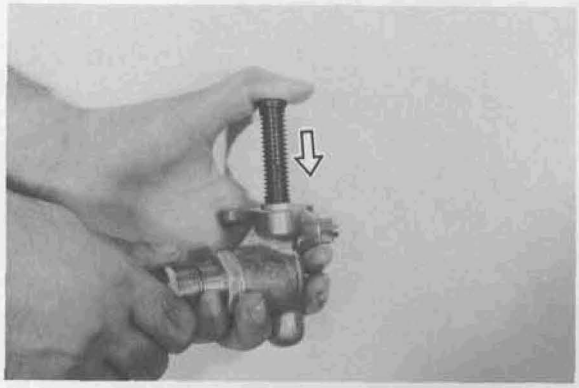


Fig. 7-58

- Tighten the lock screw to lock the pushrod, so that the pushrod will not push out.
- Secure the adjuster to the cylinder block.

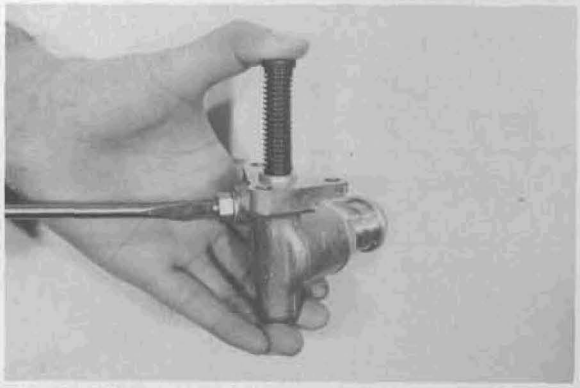


Fig. 7-59

- Back out the lock screw by one-quarter to half a turn: this separates the tip of the screw from the pushrod, thereby allowing the pushrod to advance under spring force and press the tensioner against the camshaft chain.

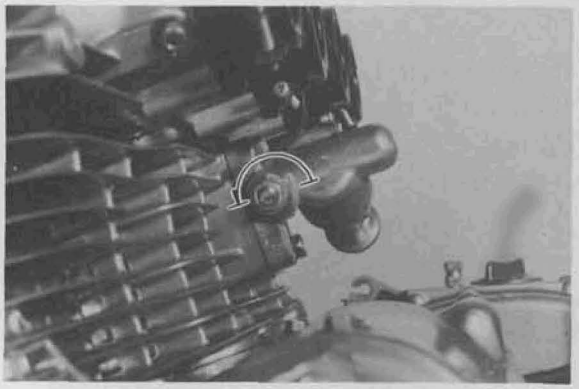


Fig. 7-60

- Tighten the lock nut.

> *NOTE:*
> *When tightening the lock nut, take care to prevent the lock screw from turning.*

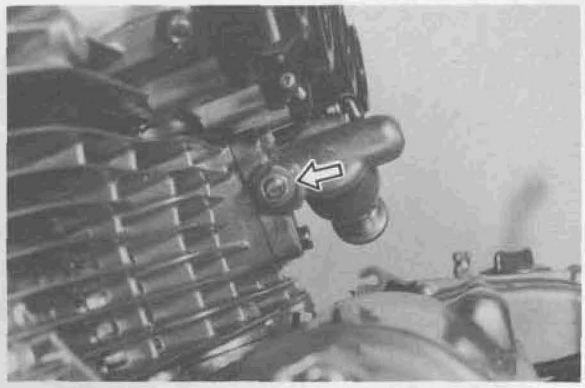


Fig. 7-61

TENSIONING ACTION CHECK

After installing the tensioner, check its tensioning action according to the following 3-step procedure:

> *CAUTION:*
> *As stated previously, do not attempt to turn over the crankshaft by using the bolt ② (which requires a 12-mm wrench): turn nut ① with a 19-mm wrench, instead.*

- While turning the tensioner knob counterclockwise, slowly rotate the crankshaft in reverse direction counter clockwise (thus causing the chain to push back the tensioner). (Fig. 7-62)

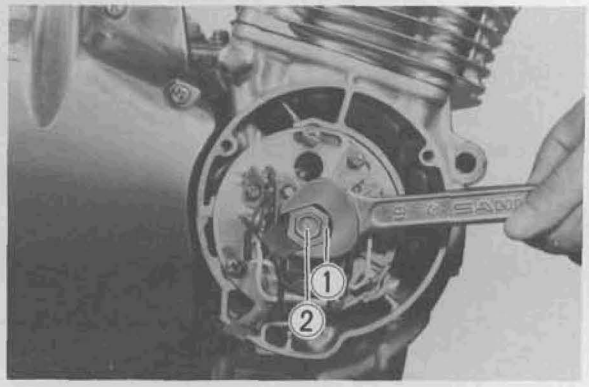


Fig. 7-62

- Release the knob and slowly turn back the crankshaft in normal running direction (to slacken that portion of the chain extending along the tensioner). See if the knob rotates by itself as the chain becomes progressively slackened; if it does, then the pushrod inside is obviously moving forward under spring force as it should, thus signifying that the tensioner is in good operable condition. If the knob rotates, but sluggishly, it means that the pushrod or lock shaft is sticking and, in such a case, remove the tensioner and service the pushrod and lock shaft to make them move smoothly. (See page 7-25).

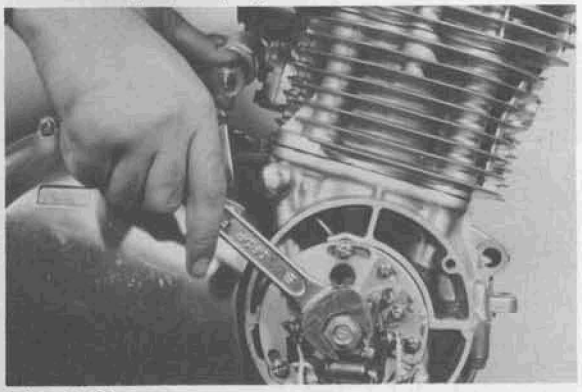


Fig. 7-63

CAUTION:
After installing the tensioner and checking it in initially set condition for operation, do not attempt to turn the knob in either direction until the next overhaul.

TAPPET CLEARANCE ADJUSTMENT

- After checking tensioning action, check all valves for tappet clearance and, as necessary, adjust the clearance to the specificaton outlined on page 3-6.

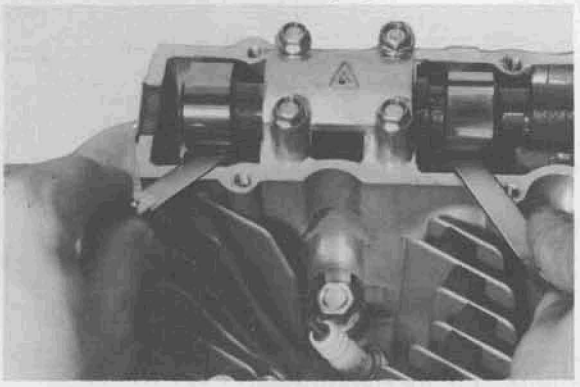


Fig. 7-64

TOP END— INSPECTION

One camshaft is provided for the intake valves and the other for the exhaust valves. Be sure to discriminate between the two. The camshafts should be checked for runout and also for the wear of cams and journals if the engine has been noted as giving abnormal noise or vibration or to lack power output. Any of these conditions may be caused by camshafts worn down or distorted to the service limit.

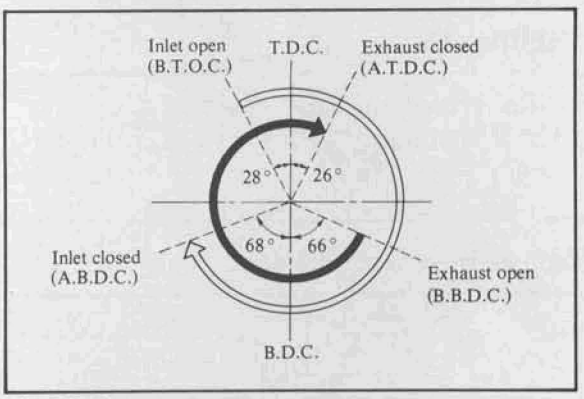


Fig. 7-65

CAMSHAFT WEAR

- Worn-down cams can be the cause of incorrect valve timing resulting in reduced power output. The limit of cam wear is specified for both intake and exhaust cams in terms of cam height Ⓗ, which is to be measured with a micrometer. Replace camshafts if found worn down to the limit.

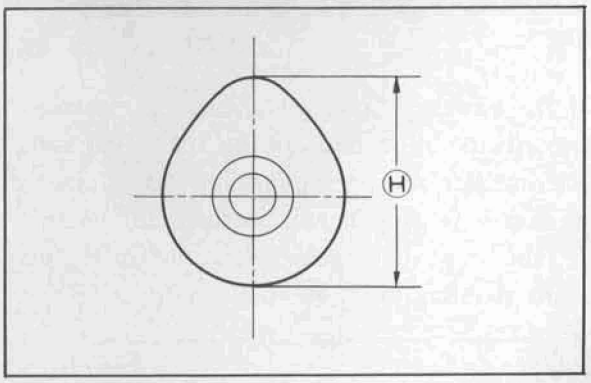


Fig. 7-66

Cam height

Height Ⓗ	Standard	Limit
Intake cams	36.320–36.360 mm (1.4299–1.4315 in)	36.020 mm (1.4181 in)
Exhaust cams	35.770–35.810 mm (1.4083–1.4098 in)	35.470 mm (1.3965 in)

CAMSHAFT JOURNAL WEAR

Install the camshaft correctly, and using a Plastigage measure the camshaft journal clearance.

Camshaft bearing cap

Camshaft bearing cap bolt tightening torque:	1.0 kg-m (7.0 lb-ft)

Camshaft-Journal clearance (IN & EX)

Standard	Limit
0.037–0.065 mm (0.0015–0.0026 in)	0.150 mm (0.0059 in)

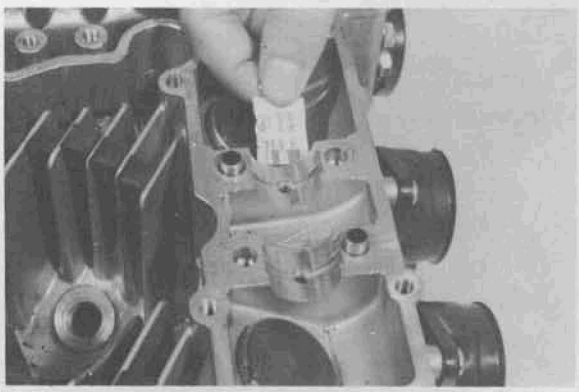


Fig. 7-67

If the camshaft journal clearance measured exceeds the limit, measure the inside diameter of camshaft bearing cap and outside diameter of camshaft. Replace either the cylinder head or the camshaft, whichever the difference from specification is greater.

Item	Standard
Camshaft journal holder I.D. (In & EX)	22.012–22.025mm (0.8666–0.8671 in)
Camshaft journal O.D. (IN & EX)	21.960—21.975 mm (0.8646—0.8652 in)

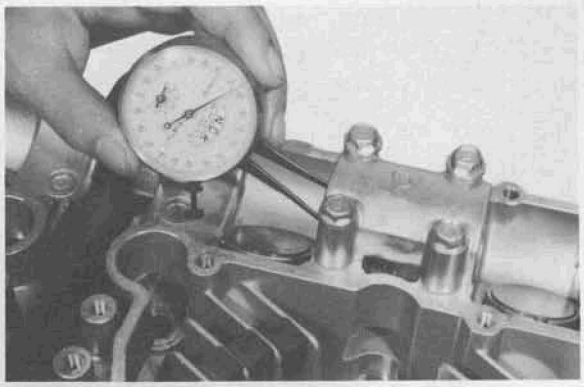


Fig. 7-68

Fig. 7-69

CAMSHAFT RUNOUT

- Measure the runout with a dial gauge. Replace the camshaft if the runout exceeds the limit.

Camshaft runout (IN & EX)

Service Limit	0.1 mm (0.004 in)

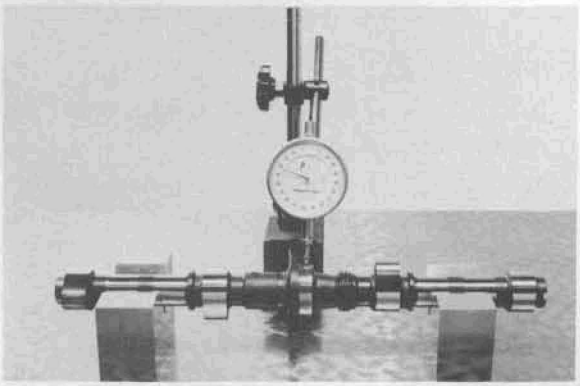


Fig. 7-70

CAM CHAIN 20 PITCH LENGTH

Pull the chain tight to remove any slack, then using vernier calipers, measure the 20 pitch length of cam chain. If it measures more than limits, replace the cam chain.

Service Limit	157.80 mm (6.213 in)

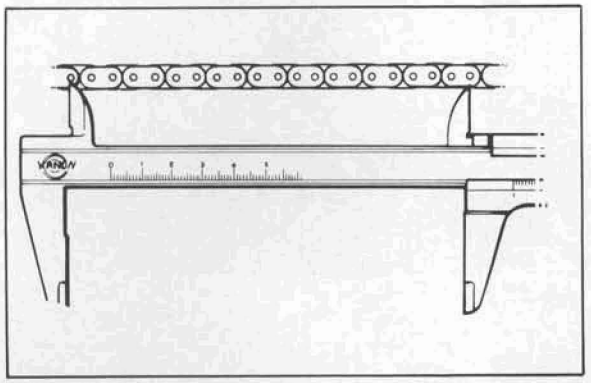


Fig. 7-71

VALVE FACE WEAR

- Visually inspect each valve for wear of its seating face. Replace any valve with an abnormally worn face.
- The thickness Ⓣ decreases as the wear of the face advances. Measure the thickness and, if the thickness is found to have been reduced to the limit, replace it.

Valve head thickness (IN & EX)

Service Limit	0.5 mm (0.02 in)

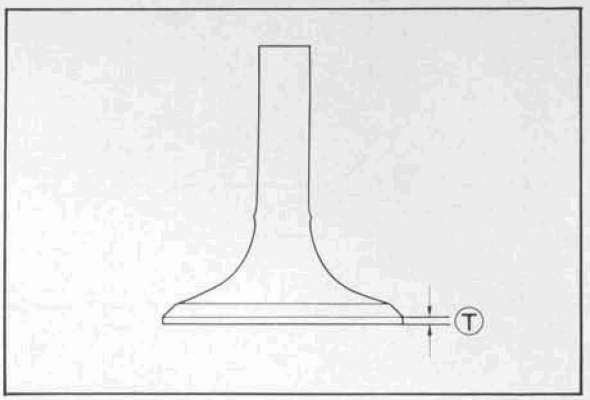


Fig. 7-72

VALVE STEM RUNOUT

- Support the valve with "V" blocks, as shown, and check its runout with a dial gauge. The valve must be replaced if the runout exceeds the limit.

Valve stem runout (IN & EX)

Service Limit	0.05 mm (0.002 in)

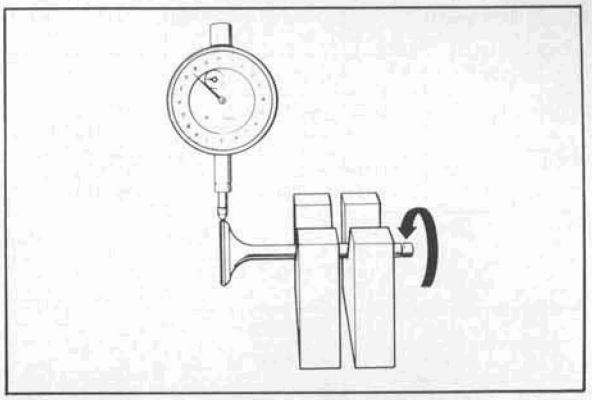


Fig. 7-73

VALVE HEAD RADIAL RUNOUT

Place the dial gauge at right angles to the valve seat, and measure the valve head radial runout. If it measures more than limit, replace the valve.

Valve head radial runout (IN & EX)

Service Limit	0.03 mm (0.001 in)

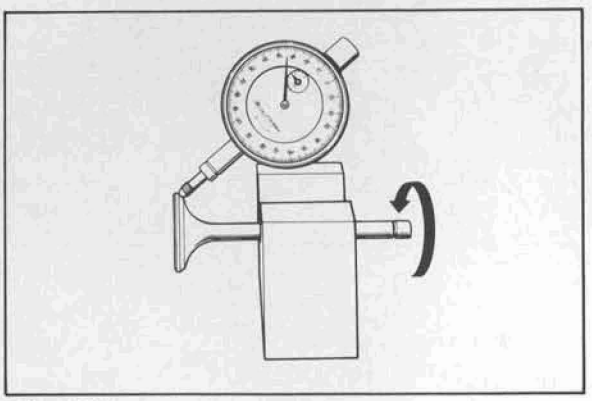


Fig. 7-74

VALVE GUIDE—VALVE STEM CLEARANCE

1. Using a micrometer, measure the outside diameter of the valve stem.
2. Using a caliper gauge, measure the inside diameter of the valve guide.
   - If the difference between the measurements in 1. and 2. above is more than limits, replace both valve guide and valve stem.

Valve guide-valve stem clearance

Valve	Standard	Limit
Intake valves:	0.025—0.055 mm (0.0009—0.0022 in)	0.35 mm (0.014 in)
Exhaust valves:	0.040—0.070 mm (0.0016—0.0028 in)	0.35 mm (0.014 in)

Valve stem O.D.

	Standard
IN	6.960—6.975 mm (0.2740—0.2746 in)
EX	6.945—6.960 mm (0.2734—0.2740 in)

Valve guide I.D.

	Standard
IN & EX	7.000—7.015 mm (0.2756—0.2762 in)

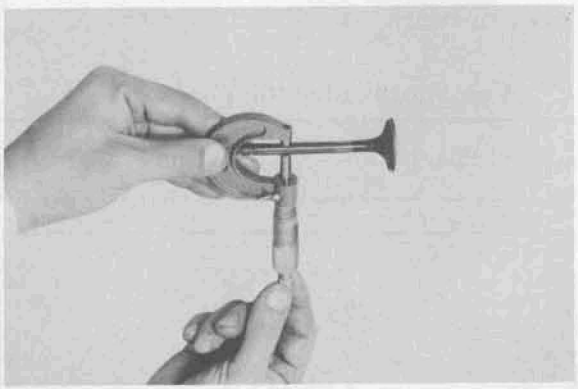


Fig. 7-75

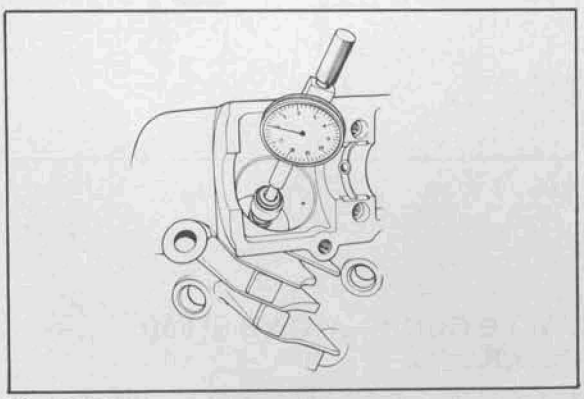


Fig. 7-76

VALVE SEAT WIDTH MEASUREMENT

- Coat the valve seat with Prussian blue uniformly. Fit the valve and tap the coated seat with the valve face in a rotating manner, in order to obtain a clear impression of the seating contact. In this operation, use the valve lapper to hold the valve head.

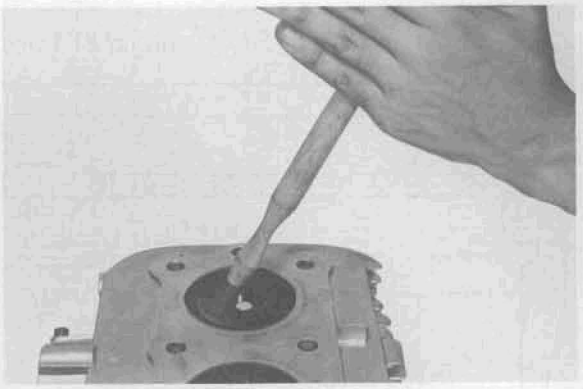


Fig. 7-77

- The ring-like dye impression left on the valve face must be continuous—without any break—and, in addition to this requirement, the width of the dye ring, which is the visualized seat "width", must be within the following specification:

Valve seat width

Seat width	Standard
Ⓦ	1.0—1.2 mm (0.04—0.05 in)

If either requirement is not met, correct the seat by servicing it as follows:

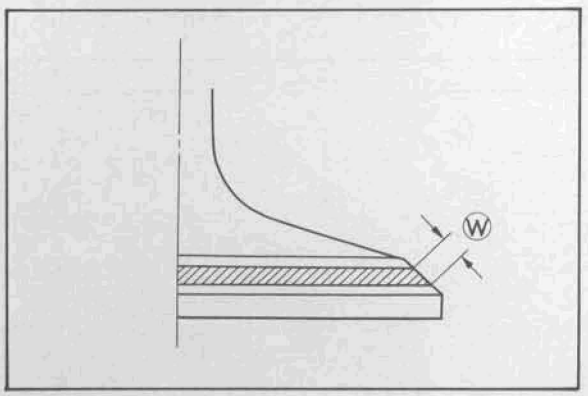


Fig. 7-78

VALVE SEAT SERVICING

- The valve seats for both intake and exhaust valves are angled to present three bevels, 15° (bottom), 45° (middle) and 75° (top). To reface the seat, proceed as follows:

Valve seat cutter set	99103-45011

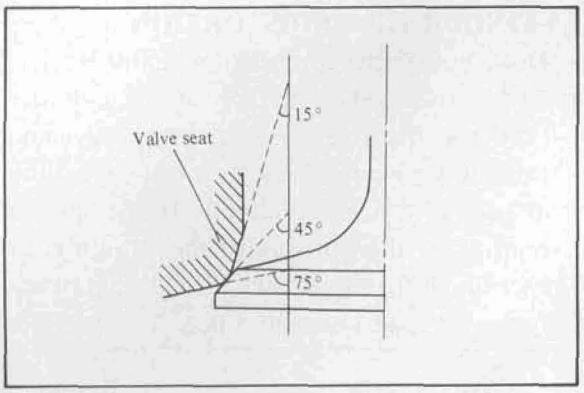


Fig. 7-79

NOTE:
The valve seat contact area must be inspected after each cut.

1. Insert with a slight rotation, the solid pilot that gives a snug fit. The shoulder on the pilot should be about 10 mm (0.39 in) from the valve guide.
2. Using the 45° cutter No. 635, descale and cleanup the seat with one or two turns.
3. Inspect the seat by the previous seat width measurement procedure. If the seat is pitted or burned, additional seat conditioning with the 45° cutter is required.

NOTE:
Cut the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the tappet for correct valve contact angle.

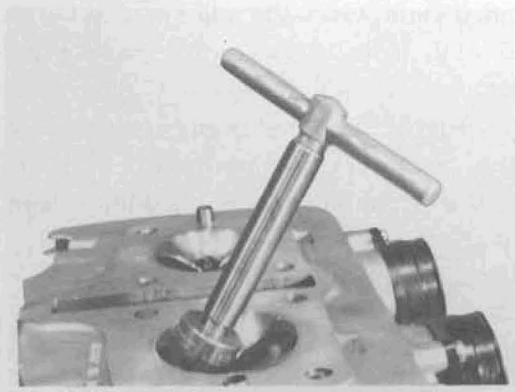


Fig. 7-80

If the contact area is too low, use 75° cutter No. 216 to raise and narrow the contact area. If the contact area is too high, use 15° cutter No. 635 to lower and narrow the contact area. After cutting the 75° and 15° angles, it is possible that the valve seat (45°) is too narrow. If so, re-cut the seat to the correct width.

4. After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations. DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.
5. Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.

NOTE:
Always use extreme caution when handling gasoline.

NOTE:
After servicing the valve seats, be sure to adjust the tappet clearance after the cylinder head has been reinstalled.

6. If, by any chance, too much stock has been removed from the seat during the refacing work resulting in loss of the specified tappet clearance even with the thinnest shim disc, then the only remedy is to grind off the stem end face of the valve with a valve refacer, thereby shortening the overall length of the valve.

IMPORTANT:
- *This remedy is permissible where the length ① will not be reduced to less than 4.0 mm. If this length becomes shorter than 4.0 mm (0.16 in), then the valve must be replaced.*
- *After installing the valve whose stem end has been ground off as above, check that the face ② of valve stem end is above the cotter pin ③.*

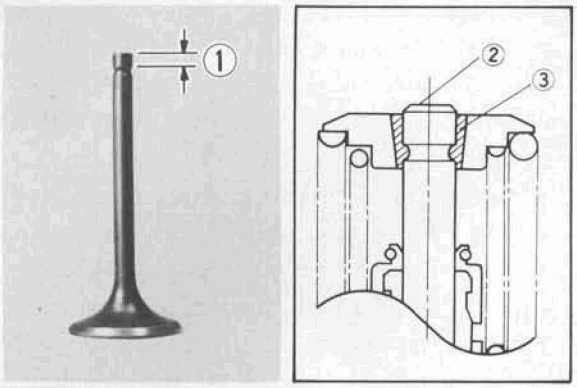


Fig. 7-81

VALVE SPRINGS

- The force of the two coil springs keeps the valve seats tight. Weakened springs result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism.
- Check the springs for strength by measuring their free lengths and also the force required to compress them. If the limit indicated below is exceeded by the free length reading or if the measured force does not fall within the range specified, replace with a SUZUKI spring.

IMPORTANT:
Replace all of the valve springs at a time, if any one of these is found to be less than the limit.

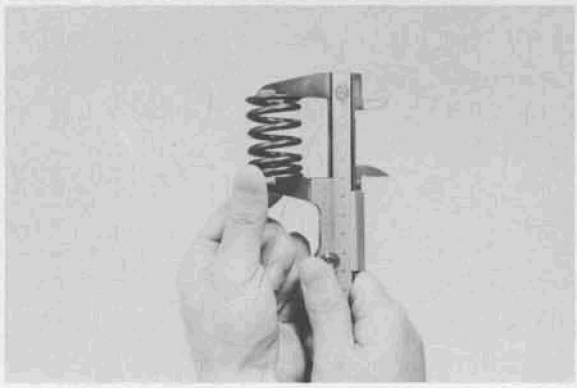


Fig. 7-82

Valve spring free length

Spring	Standard	Limit
INNER	35.3—37.0 mm (1.39—1.46 in)	33.9 mm (1.23 in)
OUTER	43.0—43.25 mm (1.69—1.70 in)	41.3 mm (1.63 in)

Valve spring tension

INNER	29.3–34.0 kg/23 mm (64.59–74.96 lb/0.91 in)
OUTER	50.4–58.3 kg/27 mm (111.11–128.53 lb/1.06 in)

CYLINDER HEAD DISTORTION

- Decarbonize the combustion chambers.
- Check the gasket surface of the cylinder head for distortion with a straightedge and thickness gauge, taking a clearance reading at several places indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder head.

Cylinder head distortion

Service Limit	0.2 mm (0.008 in)

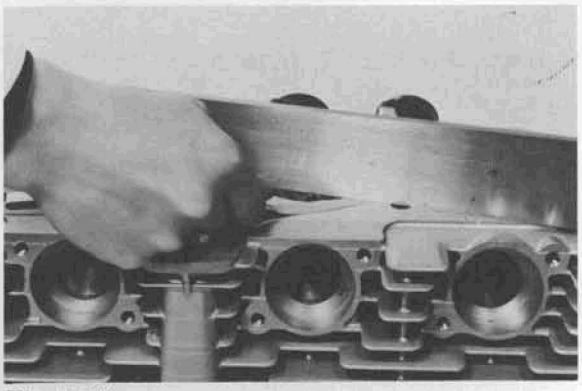


Fig. 7-83

CAM CHAIN TENSION ADJUSTER

The tension adjuster used in the Model GS850G is of automatic type in that it adjusts itself to apply a constant tensioning force to the chain by compensating for the stretch of the chain.

In operation, its spring-loaded pushrod keeps on pushing the timing chain. As the chain stretches, it yields to this push and remains in tensioned state. Once the adjuster is set after installation, there is no need of making any adjustment.

The pushrod is prevented from backing away. By this feature, the pushrod effectively contends with the tendency of the timing chain to shake or vibrate during rough driving condition.

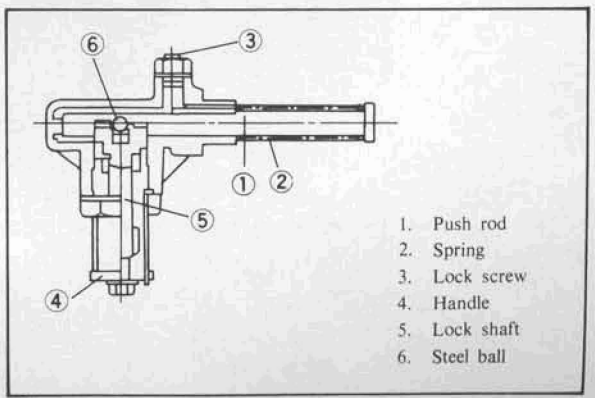


Fig. 7-84

REASSEMBLING

1. Apply a high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE: 99000-25140) to the pushrod and engine oil to the pushrod guide hole. Match the lock screw to the long groove in the pushrod, as shown, and insert the pushrod by pushing it to the indicated position.

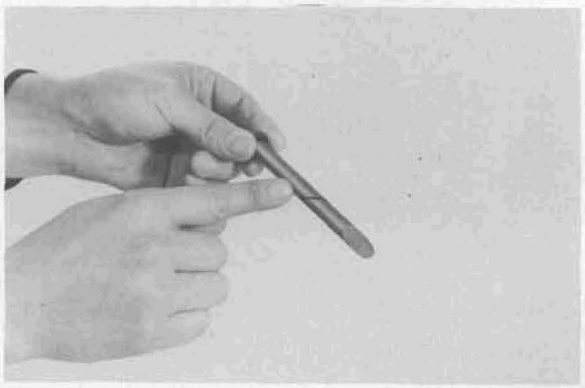


Fig. 7-85

Fig. 7-86

2. Move the pushrod back and forth with fingers to see if it moves smoothly as it should.

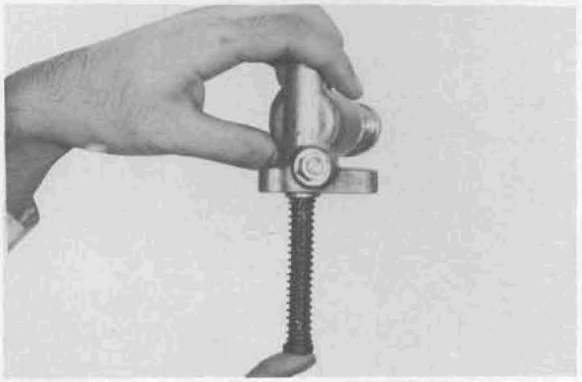


Fig. 7-87

3. With the pushrod inserted, run in the lock screw until its tip bears against the pushrod. From that position of the screw, back it away by one-quarter rotation.

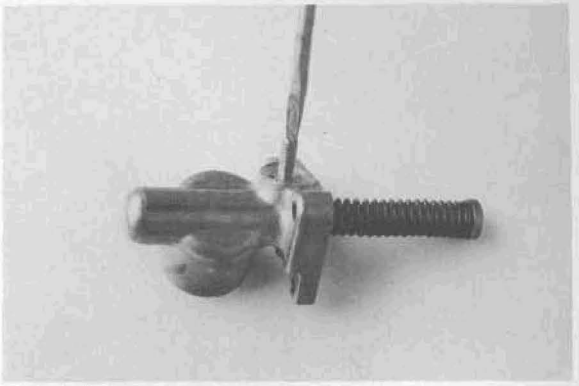


Fig. 7-88

4. Apply engine oil to the lock shaft. Insert the shaft into the holder and bring the two into the relative position indicated.

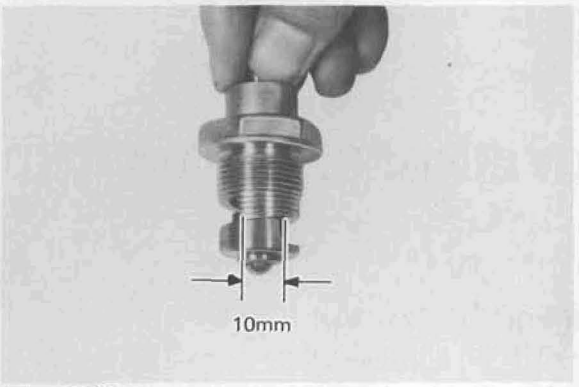


Fig. 7-89

5. Hook the spring onto the holder and handle, twist the spring by one complete rotation counterclockwise, and fit the handle onto the shaft.

Fig. 7-90

6. After tightening the lock shaft nut, install the lock shaft assembly on the adjuster body. Be sure to adhere to the following torque specifications:

Lock shaft nut tightening torque	0.8–1.0 kg-m (6.0–7.0 lb-ft)
Shaft assembly tightening torque	3.1–3.5 kg-m (22.5–25.5 lb-ft)

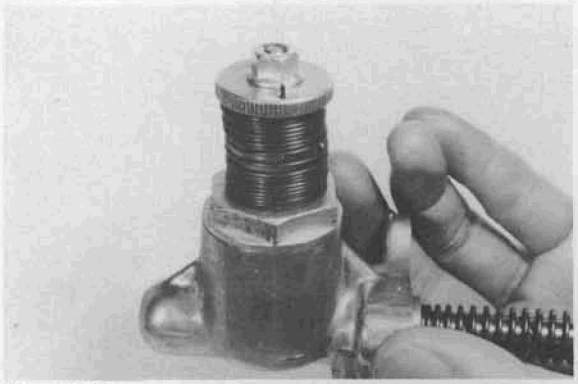


Fig. 7-91

CYLINDER, PISTON AND RINGS

REMOVAL

REMOVE CYLINDER BLOCK

- After removing cylinder head, firmly grip the cylinder block at both ends, and lift it straight up. If the block does not come off, lightly tap on the finless portions of the block with a plastic mallet to shake the gasketed joint loose.

NOTE:
Cylinder removal from crankcase is made easier by the use of the cylinder disassembling tool. This tool can be used on the cylinder head, too.

Cylinder disassembling tool	09912-34510

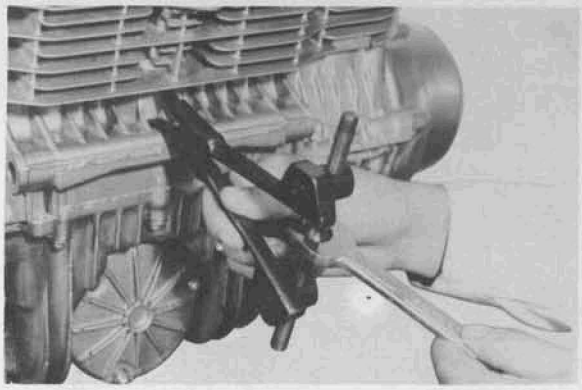


Fig. 7-92

REMOVE PISTON

- Place a rag beneath the piston to prevent parts from falling into the crankcase, and remove the circlip with pliers.

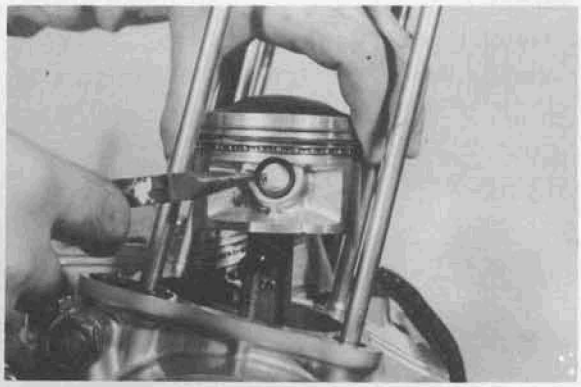


Fig. 7-93

- Scribe the cylinder No. on the head of the piston, and draw out the piston pin with the special tool ① . Place the drawn-out piston pin in the same place as that given the cylinder No. on the head of the piston.

Piston pin puller	09910-34510

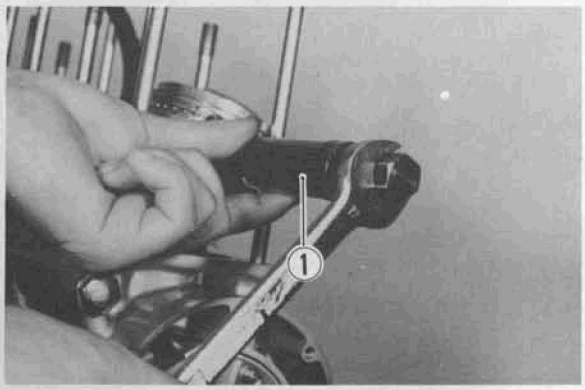


Fig. 7-94

- In order to remove the piston ring, open the gap far enough for the entire ring to clear the piston, then push it off.

Fig. 7-95

INSPECTION

CYLINDER BORE

As illustrated in Fig. 7-96, measure the cylinder bore diameter at six places.

If any one of the measurements exceeds the limit, overhaul the cylinder and replace the piston with an oversize, or replace the cylinder. If one cylinder is worn to the point that it needs to go oversize all cylinder should go oversize at the same time. Otherwise the imbalance might cause excess vibration.

Cylinder bore

Standard	Limit
69.000—69.015 mm (2.7165—2.7171 in)	69.080 mm (2.7197 in)

Oversize piston	0.5 mm, 1.0 mm

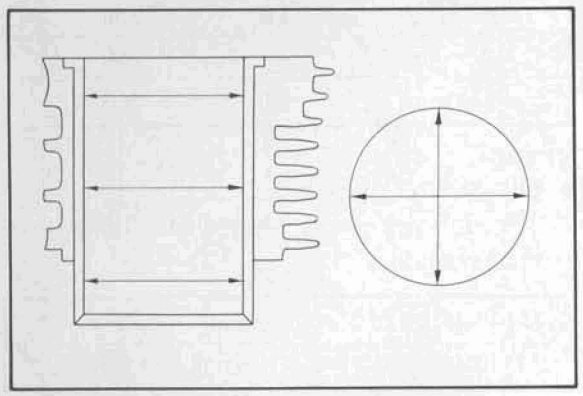


Fig. 7-96

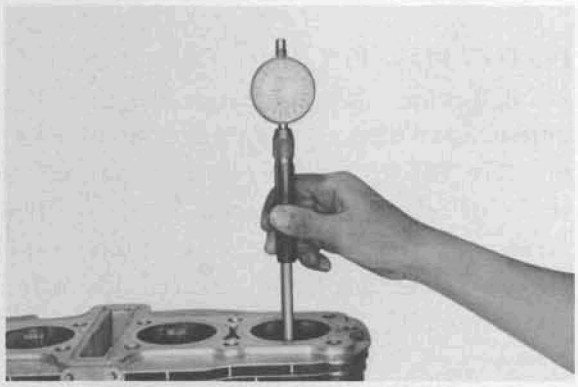


Fig. 7-97

PISTON DIAMETER

Using a micrometer, measure the piston outside diameter at the place shown in Fig. 7-98. If the measurement is less than the limit, replace the piston.

Standard	Limit
68.945—68.960 mm (2.7144—2.7150 in)	68.880 mm (2.7118 in)

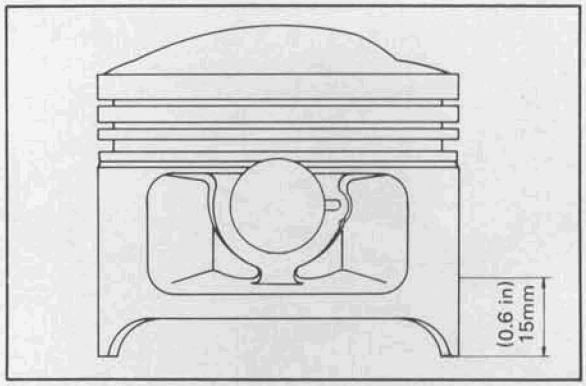


Fig. 7-98

PISTON-CYLINDER CLEARANCE

As a result of the above measurement, if the piston clearance exceeds the limit shown in the table below, overhaul the cylinder and use an oversize piston, or replace both cylinder and piston.

Standard	Limit
0.050—0.060 mm (0.0020—0.0024 in)	0.120 mm (0.0047 in)

PISTON RING-GROOVE CLEARANCE

- Using a thickness gauge, measure the side clearances of the lst and 2nd rings. If any of the clearances exceeds the limit, replace both piston and piston rings.

Piston ring-groove clearance

Piston ring	Standard	Limit
1st	0.020—0.055 mm (0.0008—0.0022 in)	0.18 mm (0.0071 in)
2nd	0.020—0.060 mm (0.0008—0.0024 in)	0.15 mm (0.0059 in)

Piston ring groove width

Piston ring	Standard
1st	1.21—1.23 mm (0.047—0.048 in)
2nd	1.21—1.23 mm (0.047—0.048 in)
Oil	2.51—2.53 mm (0.099—0.100 in)

Piston ring thickness

Piston ring	Standard
1st	1.175—1.190 mm (0.0463—0.0469 in)
2nd	1.170—1.190 mm (0.0461—0.0469 in)

Thickness gauge	09900-20803

Fig. 7-99

PISTON RING FREE END GAP AND PISTON RING END GAP

- Before installing piston rings, measure the free end gap of each ring using vernier calipers. Next, fit the ring in the cylinder, and measure each ring end gap using a thickness gauge.
  If any ring has an excess end gap, replace the ring.

Piston ring free end gap

Piston ring	Standard	Limit
1st	Approx 9.0 mm (0.35 in)	7.2 mm (0.28 in)
2nd	Approx 9.5 mm (0.37 in)	7.6 mm (0.30 in)

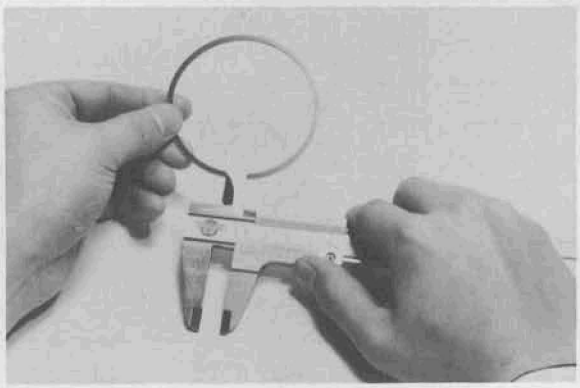


Fig. 7-100

Piston ring end gap

Piston ring	Standard	Limit
1st & 2nd	0.1—0.3 mm (0.004—0.012 in)	0.7 mm (0.03 in)

Thickness gauge	09900-20803

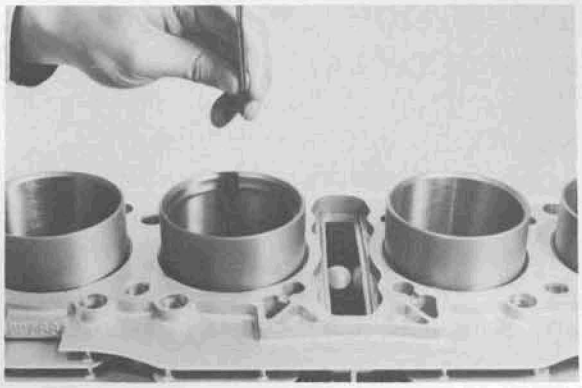


Fig. 7-101

- Oversize piston rings
  The following two types of oversize piston rings are used. They bear the following identification numbers.

	1st	2nd
0.5 mm	50	50
1.0 mm	NIL	NIL

- Oversize oil rings
  The following over size piston ring sets are available.

12140-45120-050	0.5 mm over size
12140-49001	1.0 mm over size

PISTON PIN—PIN BORE CLEARANCE

Using a caliper gauge, measure the piston pin bore inside diameter, and using a micrometer, measure the piston pin outside diameter. If the difference between these two measurements is more than the piston pin-to-pin bore clearance limit, replace both piston and piston pin.

Piston pin-Pin bore clearance

Standard	Limit
0.002—0.013 mm (0.0001—0.0005 in)	0.12 mm (0.0047 in)

Piston pin bore I.D.

Standard
16.002—16.008 mm (0.6300—0.6302 in)

Using a micrometer, measure the piston pin outside diameter.

Piston pin O.D.

Standard
15.995—16.000 mm (0.6297—0.6300 in)

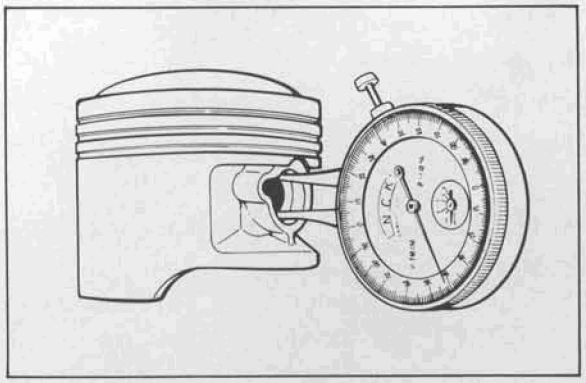


Fig. 7-102

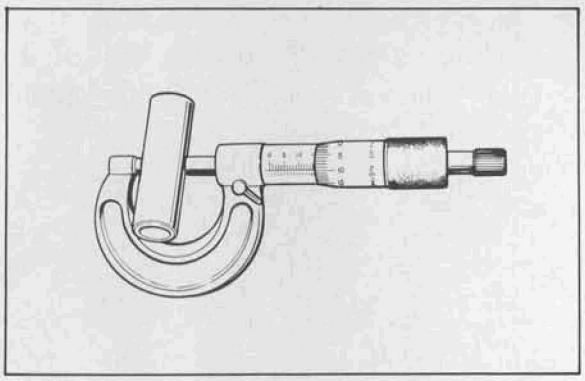


Fig. 7-103

CONNECTING ROD SMALL END BORE I.D.

Using a caliper gauge, measure the connecting rod small end diameter.

Connecting rod small end bore I.D.

Standard
16.006—16.014 mm (0.6302—0.6305 in)

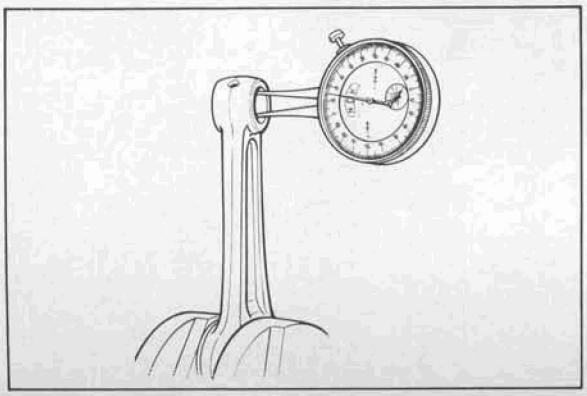


Fig. 7-104

Connecting rod small end bore-Piston pin clearance

Standard	Limit
0.006—0.019 mm (0.0002—0.0007 in)	0.080 mm (0.0031 in)

- If the difference between the connecting rod small end bore inside diameter and the piston pin outside diameter exceeds the abovementioned limit, replace both connecting rod and piston pin.

INSTALLATION

- Mount the piston ring in the order of oil ring, 2nd ring and top ring.
- Three rings should be mounted to the groove of the oil ring. First, mount the spacer ①. Then, mount the side rails ② to the upper and lower portions of the spacer ①.

NOTES:

- *Mounting should be carried out as explained above since the ring groove is so constructed that the spacer may not be inserted if the side rails are mounted first.*
- *Be sure to remove the carbon left in the ring groove before mounting the piston ring.*

Fig. 7-105

- Then, mount 2nd ring and the top ring to the piston. Note the following before mounting them.
  * The letter "R" is stamped on the respective end surface of 2nd ring and the top ring. Mount them with the stamped end surfaces turned upward.

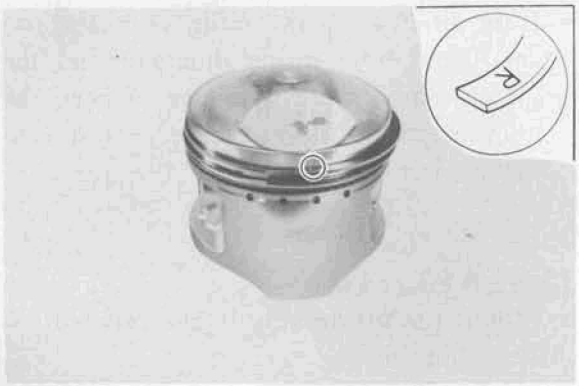


Fig. 7-106

  * How to discriminate top ring and 2nd ring. Top ring and middle (2nd) ring differ according to the shape of ring face. In addition the face of top ring is chrome-plated whereas that of 2nd ring is not. The color of 2nd ring appears darker than that of the top one.

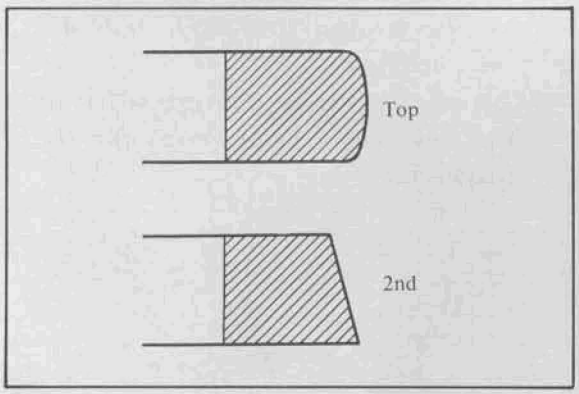


Fig. 7-107

Piston should be mounted to the connecting rod in the following manner

- Before mounting the piston, be sure to remove the carbon left on the upper part of the piston using a soft metal scraper.
- Coat the piston pin with engine oil, and insert the piston pin into the piston by pushing it by hand, directing the arrow mark on the top of the piston towards the exhaust side.

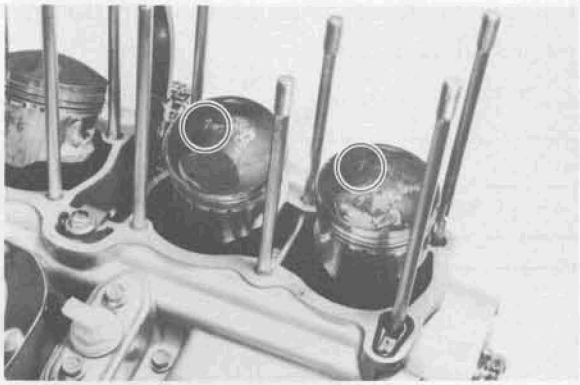


Fig. 7-108

- Place a rag beneath the piston, and install the circlip.
- Replace the circlip by a new one. Once removed, the circlip becomes misshapen and loses its tension. It should always be replaced.
- The circlip should be installed in such a position ① that the mating ends of the circlip do not coincide with the groove portion of the piston.

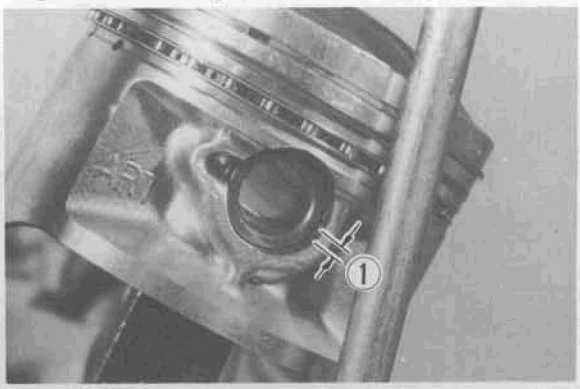


Fig. 7-109

- Before putting on the cylinder, oil the big and small ends of each connecting rod and also the sliding surface of each piston. Check that the "O" rings ① and ② are accurately positioned in the groove.

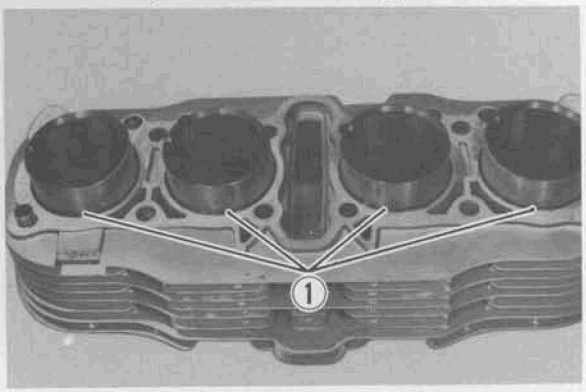


Fig. 7-110

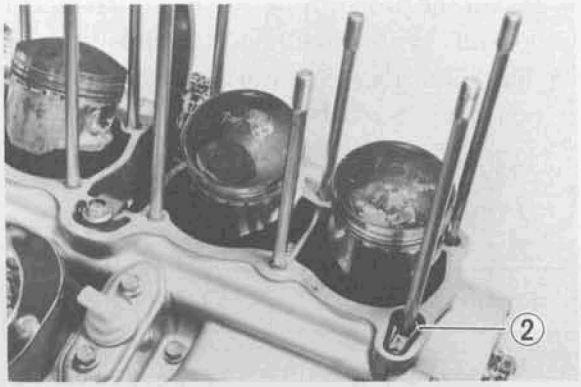


Fig. 7-111

POSITIONING OF RING GAPS

- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.

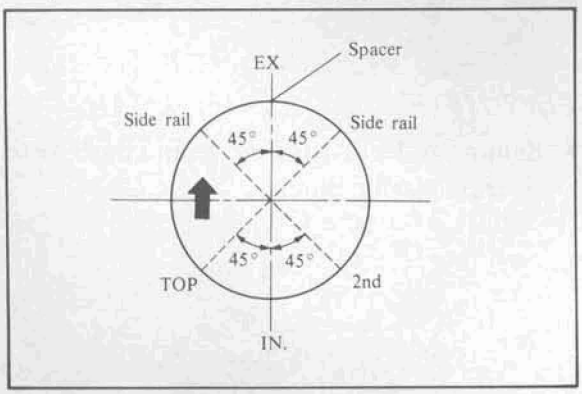


Fig. 7-112

- Set the ring gaps as shown in Fig. 7-112 on No. 2 and No. 3 pistons, and then install piston ring compressor (special tool) in the manner indicated. Some light resistance must be overcome to lower the cylinder block.
- With No.2 and No.3 pistons in place, install No.1 and No.4 pistons and insert them into the cylinder.

NOTE:

- *Do not overtighten the special tool bands or the cylinders will not admit the pistons.*
- *To rotate the crankshaft, pull the slack out of the camshaft-chain with one hand and turn the shaft in normal running direction with the other hand, using a 19-mm wrench.*

①	Holder body	09916-74520
②	Band	09916-74540

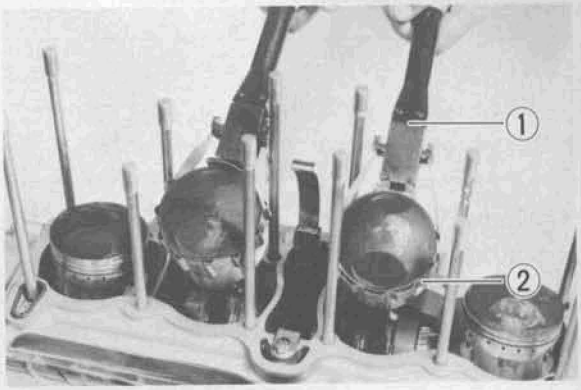


Fig. 7-113

LOWER END

GENERATOR STATOR

REMOVAL

- Remove two bolts and starter motor cover.
- Place oil pan under generator cover and remove screw to remove generator cover and gasket.

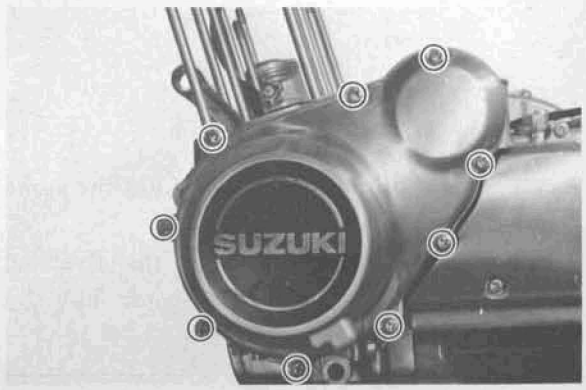


Fig. 7-114

- Remove three lead wire clamp screws ① and three stator set screws ② to remove stator.

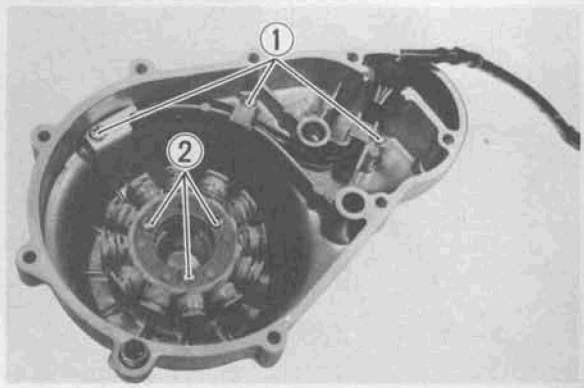


Fig. 7-115

INSTALLATION

- Apply THREAD LOCK "1342" (99000 32050) to the stator and lead wire set screws and tighten them securely.

NOTE:
Wipe off oil and grease on screw completely and then apply the screw lock.

- Mount the lead wire clamp as shown in the photo.
- Replace gasket with new one to prevent oil leakage, and tighten generator cover screw.

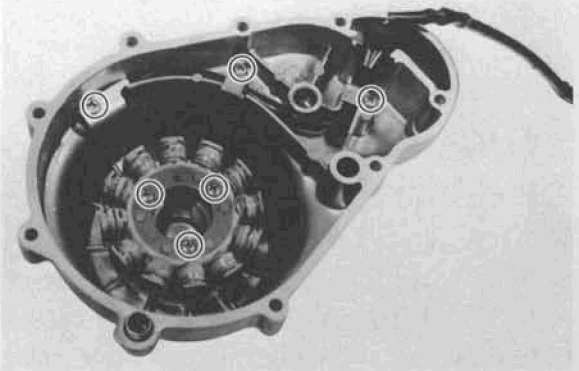


Fig. 7-116

GENERATOR ROTOR

REMOVAL

- The generator cover is removed in the same manner as for the stator.
- Securely fix the rotor with the flywheel holder ① and remove the rotor bolt by turning it counterclockwise.

Rotor holder:	09930-44910

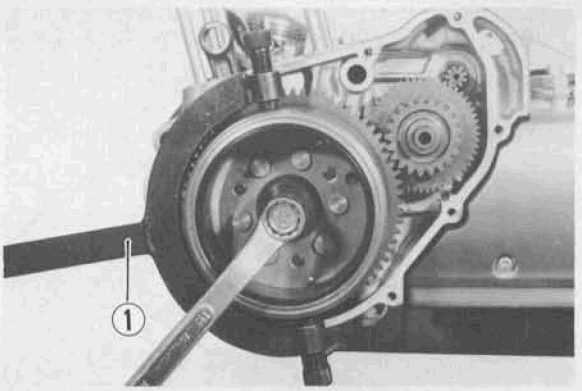


Fig. 7-117

- Install the proper rotor remover attachment ② and the slide hammer assembly into the shaft and remove rotor while sliding the remover.

NOTE:
Do not hit the rotor with a hammer.

Rotor remover set:	09930-30102

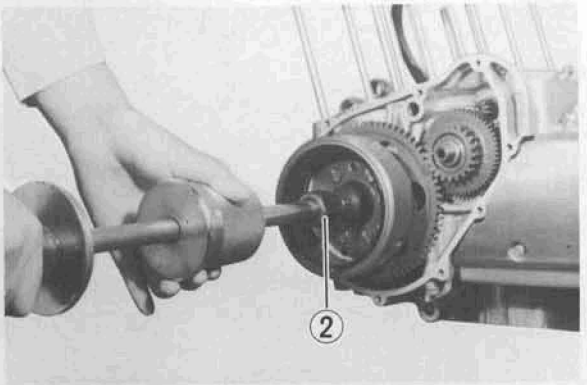


Fig. 7-118

- Remove roller ①, spring ② and push piece ③ from starter clutch.

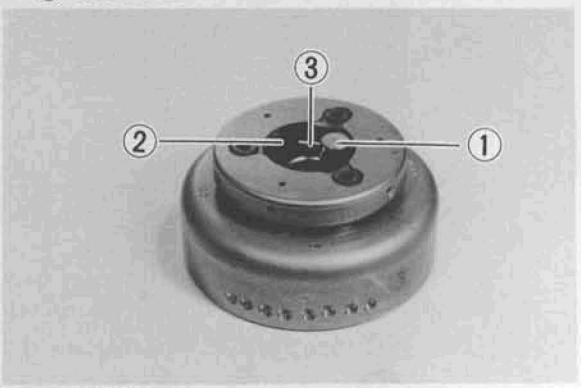


Fig. 7-119

- Clamp the rotor with a vise taking care not to damage it and separate starter clutch from the rotor using the T type hexagonal wrench ④.

"T type hexagonal wrench:	09914-25811

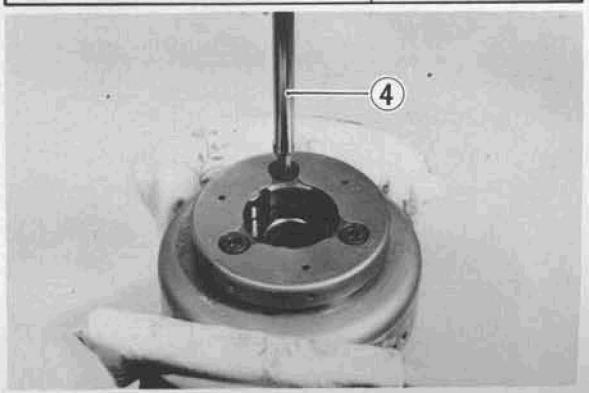


Fig. 7-120

INSTALLATION

- Installation is carried out in the reverse order of removal.
- Apply THREAD LOCK SUPER "1333B" (99000-32020) to Allen bolt.
- Thick copper washer ① is mounted with its notch directed towards crankshaft.

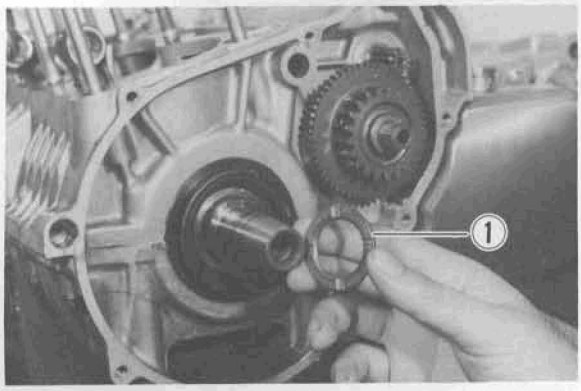


Fig. 7-121

- Clean the tapered portion of the rotor and also the crankshaft. Use cleaning solvent to wipe off oil or grease so that the surfaces become completely dry.
- After mounting the rotor, secure it by tightening the center bolt to the specified torque value with applying thread lock super "1303".

99000-32030	Thread lock super "1303"

Bolt tightening torque:	9.0–10.0 kg-m (65.0–72.5 lb-ft)

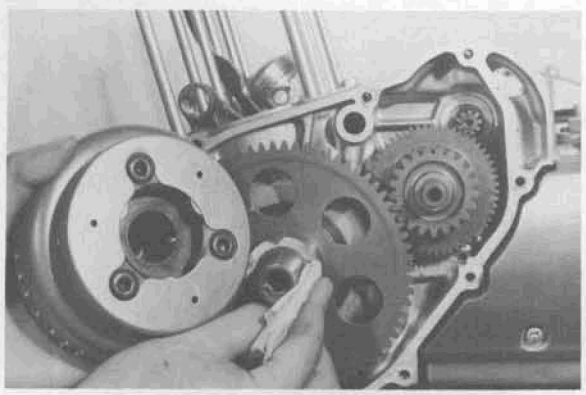


Fig. 7-122

- Replace gasket by new one to prevent oil leakage.

CONTACT BREAKER POINTS

REMOVAL

- Remove points cover and gasket.
- Remove the mounting screws and points.

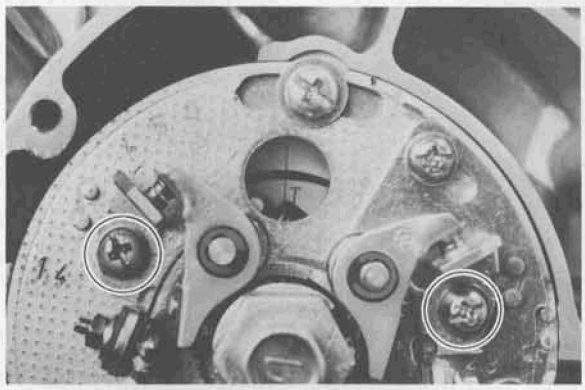


Fig. 7-123

- Loosen lead wire mounting nut and remove condenser and ignition coil lead wires from the points.

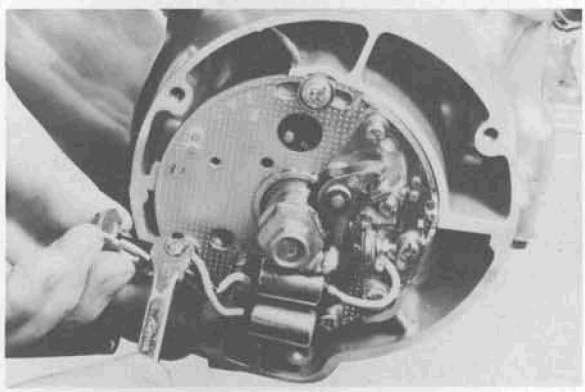


Fig. 7-124

INSTALLATION

- Installation is carried out in the reverse order of removal.
- The condenser and ignition coil lead wires are mounted on the outer side of insulated washer.

CONDENSER

REMOVAL

- Remove point cover and gasket.
- Remove condenser mounting screws and then condenser from contact breaker.

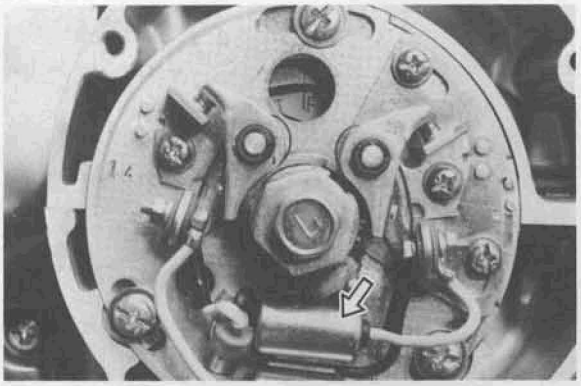


Fig. 7-125

INSTALLATION

- Installation is carried out in the reverse order of removal.
- Condenser lead wire is mounted on the outer side of the insulated washer.

AUTOMATIC ADVANCER FOR CONTACT BREAKER

REMOVAL

- Remove points cover and gasket.
- Use a wrench to hold the crank turning nut while removing automatic advancer mounting bolt.

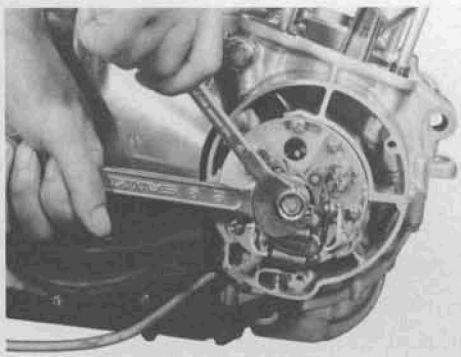


Fig. 7-126

- Remove mounting screws for contact breaker assembly and then remove the assembly and the automatic advancer.

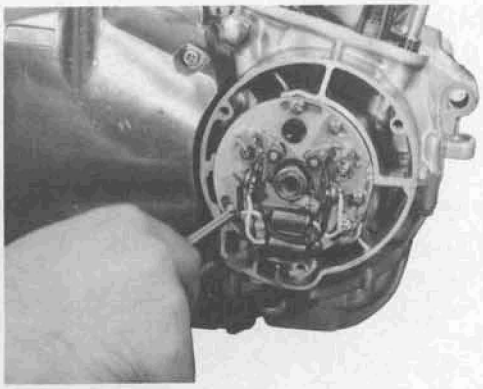


Fig. 7-127

INSTALLATION

- Installation is carried out in the reverse order of removal.
- Make sure to fit the slot on the back surface of the automatic advancer over the locating pin at the end of crankshaft and the groove of the crankshaft turning nut.

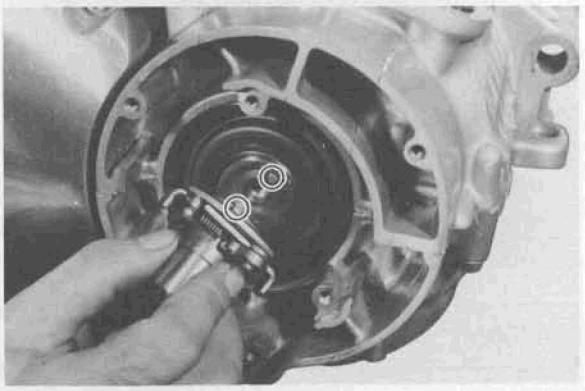


Fig. 7-128

- Adjust ignition timing (see page 3-9).

DISMANTLING OF AUTOMATIC ADVANCER

- Extract cam from the automatic advancer body and wipe off dirt, etc., completely from the cam.

Fig. 7-129

ASSEMBLY

- When installing the cam, the notch ① on the end face of the cam is aligned with the notch ② of the automatic advancer body.

Tightening torque	1.8–2.8 kg-m (13.0–20.0 lb-ft)

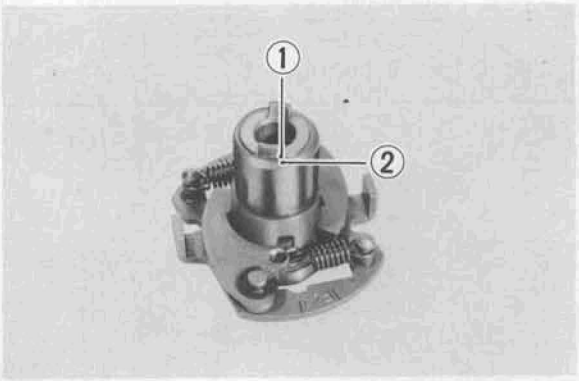
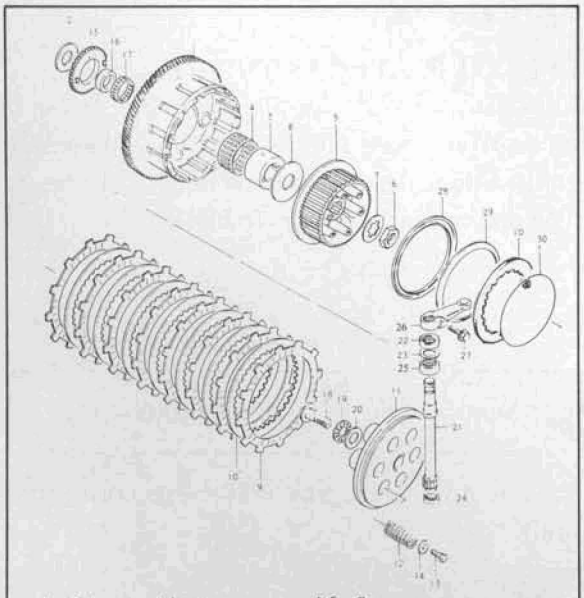


Fig. 7-130

CLUTCH



1. Primary driven gear assy
2. Washer
3. Spacer
4. Bearing
5. Sleeve hub
6. Nut
7. Lock washer
8. Washer
9. Drive plate
10. Driven plate
11. Pressure plate
12. Spring
13. Bolt
14. Washer
15. Oil pump drive gear
16. Spacer
17. Bearing
18. Clutch release rack
19. Thrust bearing
20. Washer
21. Clutch release pinion
22. Oil seal
23. Washer
24. Oil seal
25. Bearing
26. Clutch release arm
27. Bolt
28. Wave washer seat
29. Wave washer
30. Stopper ring

Fig. 7-131

REMOVAL

- Remove the cam lever bolts for clutch cable and clutch cover screw.

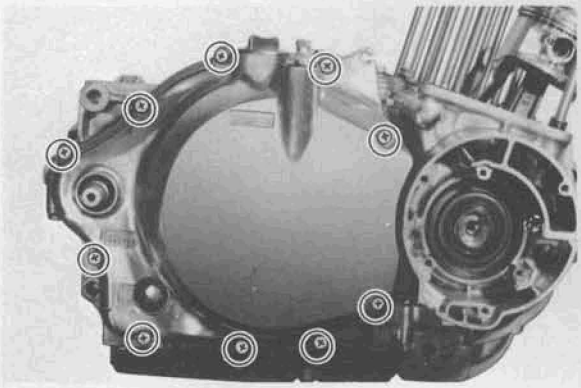


Fig. 7-132

- Remove clutch cover and gasket.
- Remove clutch spring mounting bolts and remove spring and pressure plate.

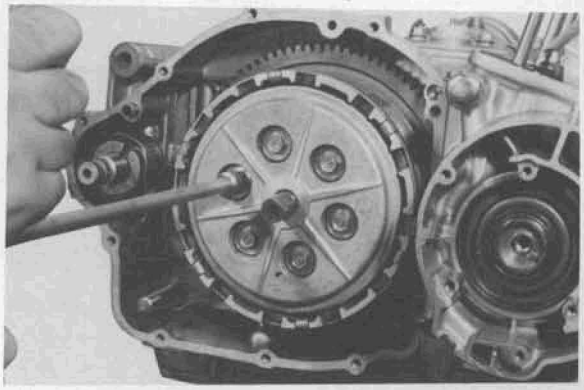


Fig. 7-133

- Remove clutch release rack ①, needle bearing ② and washer ③ from pressure plate.

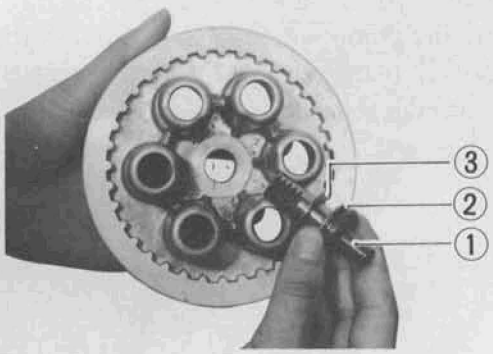


Fig. 7-134

- After removal of several clutch driven and drive plates, firmly secure clutch sleeve hub to remove mounting nut with special tool ① .

Clutch sleeve hub holder:	09920-53710

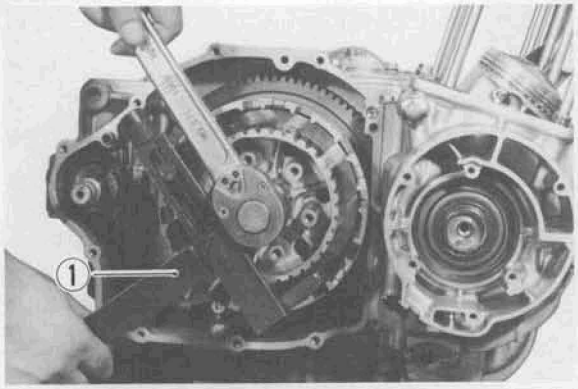


Fig. 7-135

- Remove washer, sleeve hub and the remaining plates.
  Screw two 6 mm screws into the primary driven gear spacer and pull the spacer out. With the spacer removed, the primary driven gear (integral with the clutch housing) is free to disengage from the primary drive gear.

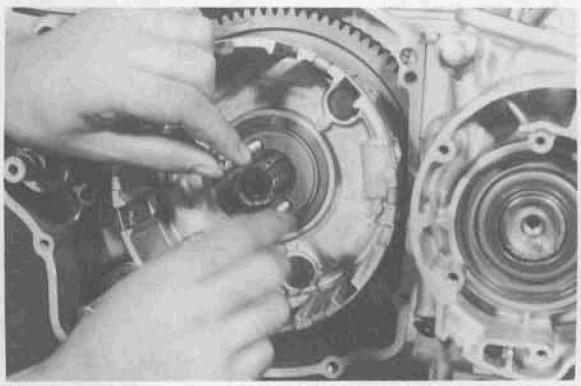


Fig. 7-136

- Grip the driven plate with pliers and remove the piano wire clip. Next, pull out the driven plate, spring and spring seat from the clutch sleeve hub.

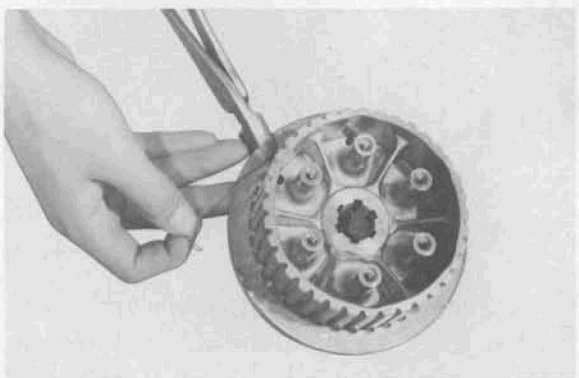


Fig. 7-137

INSPECTION

DRIVE PLATE THICKNESS

Measure the thickness of each drive plate with vernier calipers. Replace drive plates found to have worn down to the limit.

Drive plate thickness

Standard	Limit
2.7—2.9 mm (0.106—0.114 in)	2.4 mm (0.094 in)

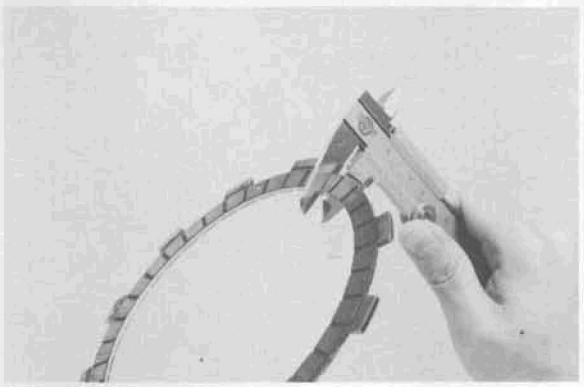


Fig. 7-138

CLUTCH PLATE DISTORTION

Check driven plate for distortion by placing it on a surface plate and by inserting a thickness gauge under the clutch plate at several places. The distortion limit is as follows:

Driven plate distortion

Service Limit	0.1 mm (0.004 in)

Be sure to replace any plates exceeding this limit.

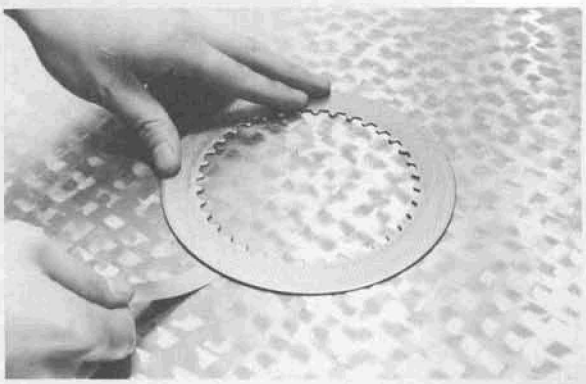


Fig. 7-140

DRIVE PLATE CLAW WIDTH

Using vernier calipers, measure the drive plate claw width. If it measures less than the limit, replace the drive plate.

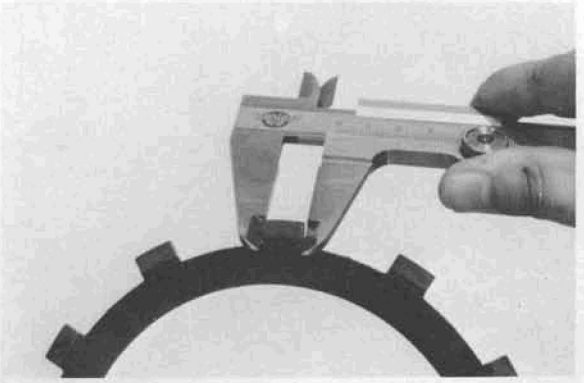


Fig. 7-141

Drive plate claw width

Standard	Limit
11.8—12.0 mm (0.46—0.47 in)	11.0 mm (0.43 in)

CLUTCH SPRING FREE LENGTH

Measure the free length of each coil spring with vernier calipers and compare the elastic strength of each with the specified limit. Replace any spring not within the limit.

Clutch spring free length

Standard	Limit
40.4 mm (1.59 in)	38.8 mm (1.53 in)

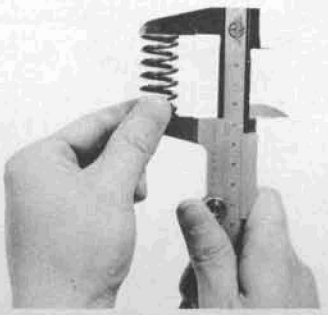


Fig. 7-142

INSTALLATION

- Fit the projection of oil pump drive gear into the notch of primary driven gear and confirm both parts fit snugly while rotating primary driven gear left and right.

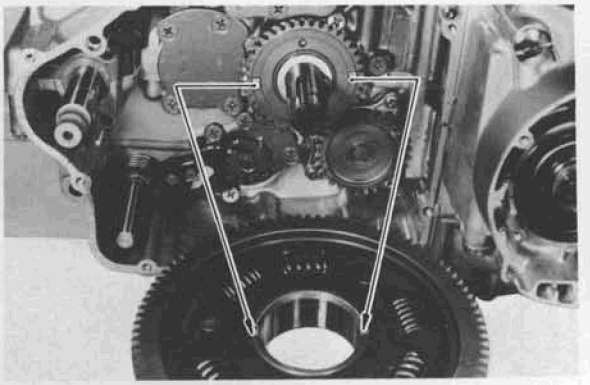


Fig. 7-144

- After installing the oil pump drive gear and primary driven gear, apply engine oil to needle bearing and spacer to assemble the needle bearing and the spacer in the prescribed order.
- Assemble the primary driven gear and then thrust washer must be installed with the grooved side facing in.

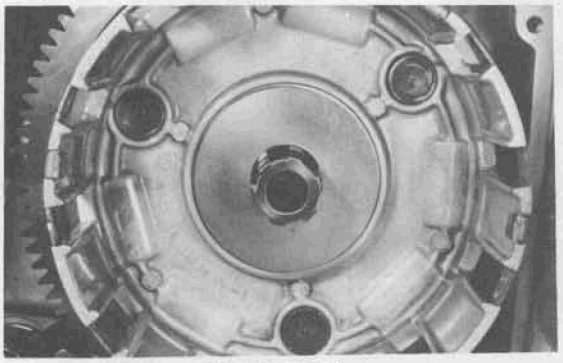


Fig. 7-145 CORRECT

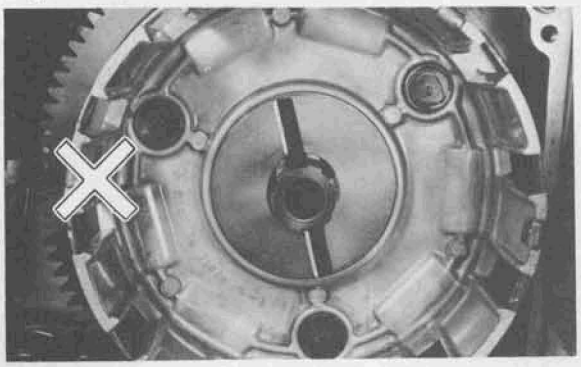


Fig. 7-146 INCORRECT

- Install the spring seat, spring and driven plate in the clutch sleeve hub. Check that these three parts are positioned correctly as illustrated below.
  While holding the driven plate with pliers, install the piano wire clip.

NOTE:
Always use a new piano wire clip.

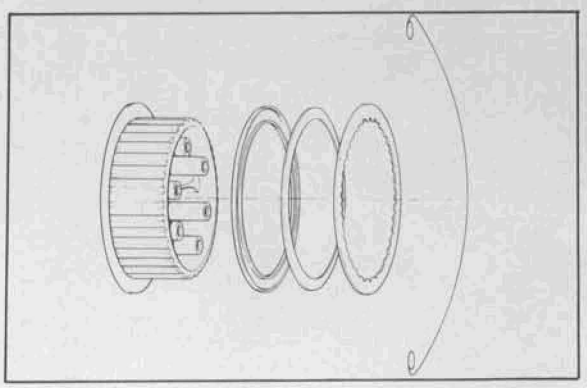


Fig. 7-147

- After tightening the clutch sleeve hub nut, be sure to lock the nut by firmly bending the tongue of the washer. Tightening torque for the nut is specified.

Clutch sleeve hub nut tightening torque:	5.0—7.0 kg-m (36.0—50.5 lb-ft)

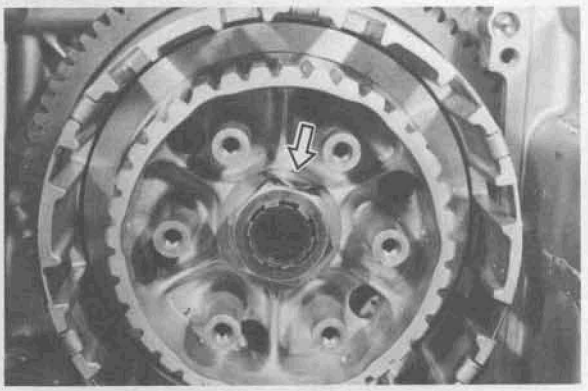


Fig. 7-148

- Insert clutch driven plate and drive plate one by one into sleeve hub in the prescribed order. Insert clutch release rack, bearing and thrust washer into pressure plate, making sure that the thrust washer is between the bearing and the pressure plate, then fit pressure plate into sleeve hub.
- Tighten clutch spring bolts in the order shown in the photo.

NOTE:
Tighten the clutch spring set bolts in the manner indicated, tightening them by degrees until they attain a uniform tightness.

Clutch spring bolt tightening torque:	1.1—1.3 kg-m (8.0—9.5 lb-ft)

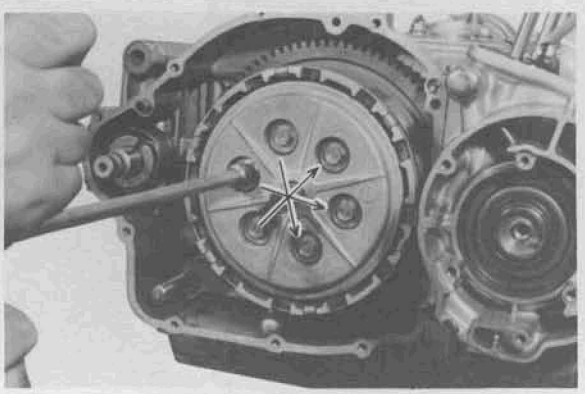


Fig. 7-149

- Replace clutch cover gasket with new one to prevent oil leakage.
- Engage the teeth of clutch release rack with those of pinion gear at the clutch cover side and replace clutch cover. Make sure that the rack and pinion gear engage positively. To install cover, tap lightly with plastic hammer and tighten screws.

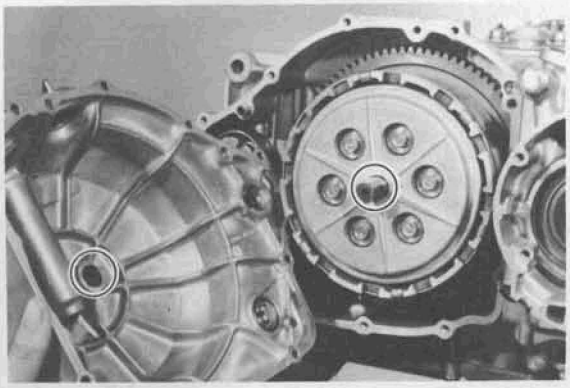


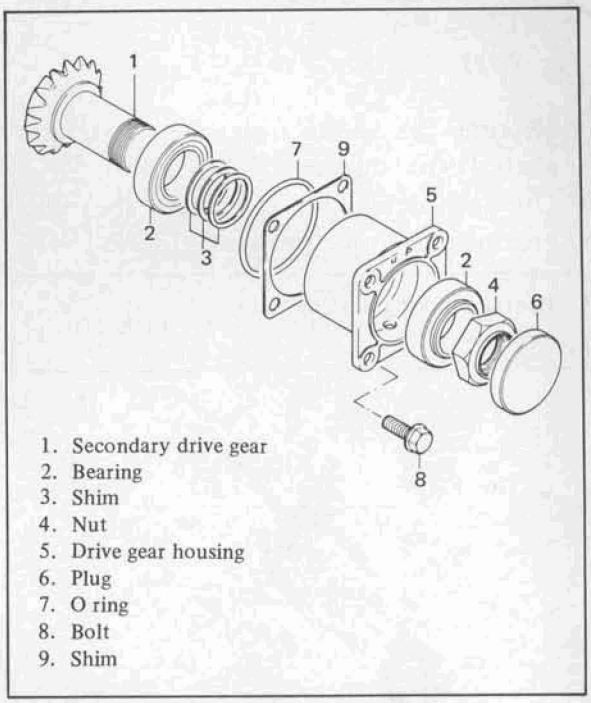
Fig. 7-150

SECONDARY BEVEL GEAR ASSEMBLY

SECONDARY DRIVE GEAR ASSEMBLY

REMOVAL AND DISASSEMBLY

- Remove the secondary unit cover; remove drain plug and drain oil into a pan.
- Remove the four mounting bolts and remove the secondary drive gear housing from the crankcase.



1. Secondary drive gear
2. Bearing
3. Shim
4. Nut
5. Drive gear housing
6. Plug
7. O ring
8. Bolt
9. Shim

Fig. 7-151

- Using a drift, knock the plug ⑥ out of the housing
- Straighten the bent area of the nut. Use special tool ① to lock the drive gear, and special tool ② to remove the nut. (Fig. 7-152)

①	Secondary drive bevel gear holder	09924-54511
②	41 mm socket wrench	09910-23710

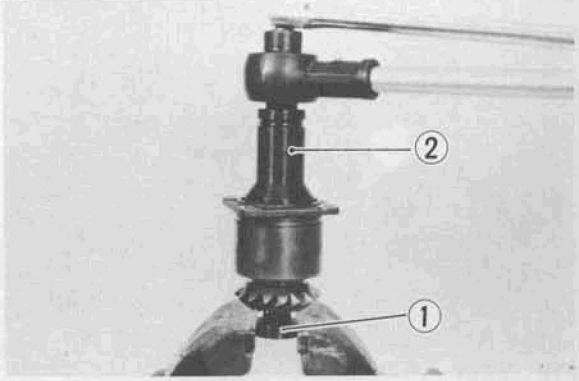


Fig. 7-152

- Tap the drive gear with a plastic hammer to remove it from the housing. (Fig. 7-154).

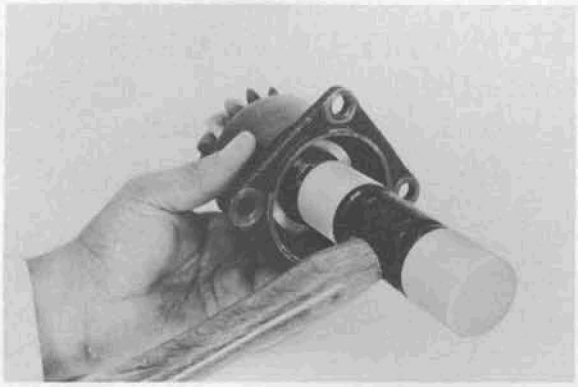


Fig. 7-153

- Remove the shims from the drive gear shaft. Do not discard.
- Use special tool ③ to remove the inner bearing race from drive gear. (Fig. 7-154)

Bearing inner race remover:	09941-84510

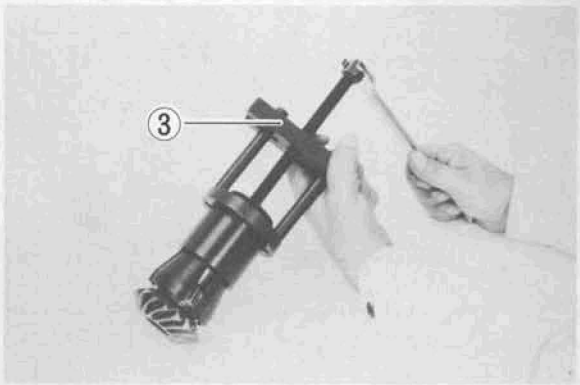


Fig. 7-154

- Use special tools ④ and ⑤ to remove the bearing outer races from the housing. (Fig. 7-155)

④	Bearing outer race remover	09941-54911
⑤	Bearing installer	09913-84510

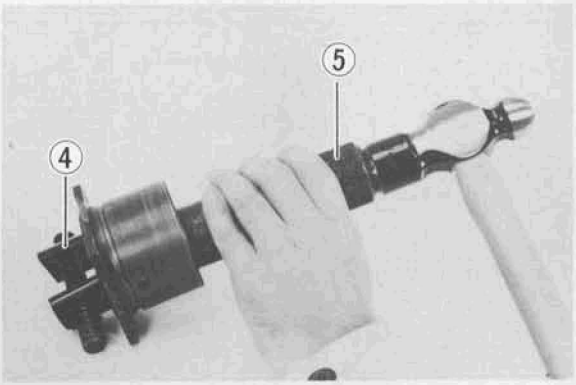


Fig. 7-155

INSPECTION AND REASSEMBLY

NOTE:
Before reassembly, clean all parts in solvent.

NOTE:
It will be helpful to have a selection of all shims on hand before beginning bearing preload adjustment.

- Use special tool ① to install the outer bearing races into the drive gear housing. (Fig. 7-156)

Bearing installer set:	09924-84510

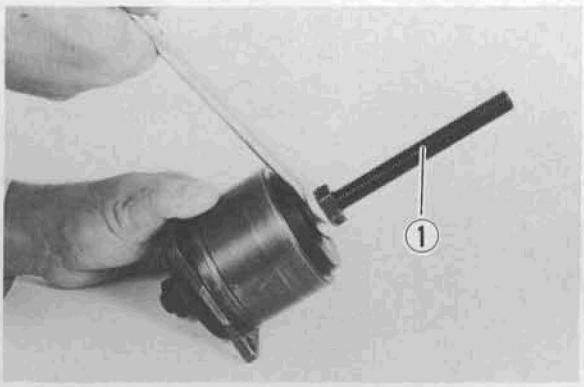


Fig. 7-156

- Use special tool ② to install the inner bearing race on the drive gear shaft. (Fig. 7-157)

Bearing installer:	09913-84510

CAUTION:
If replacing the secondary drive gear, be sure to replace secondary driven gear also, as they must be replaced together.

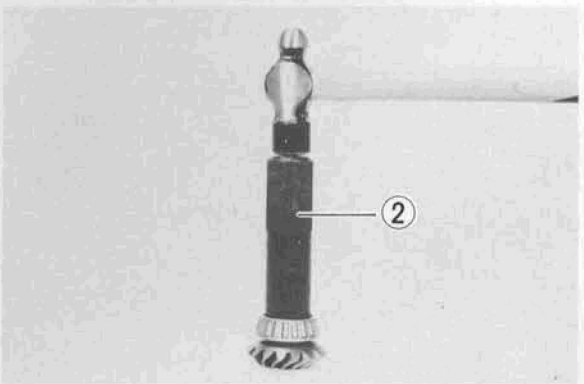


Fig. 7-157

- Install all the shims, removed during disassembly, on the drive gear shaft. (Fig. 7-158)

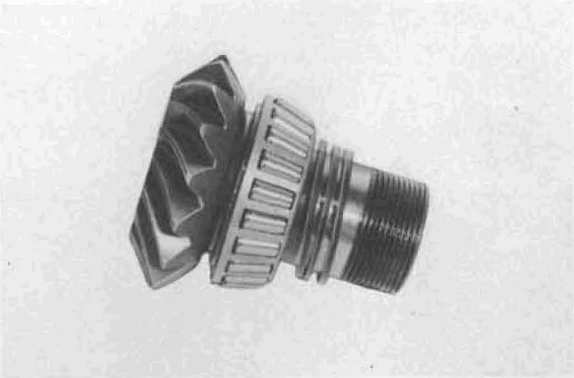
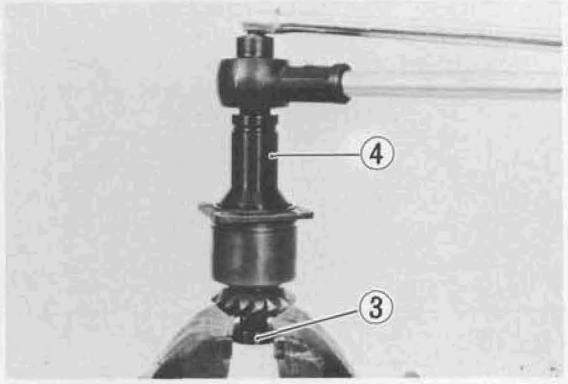


Fig. 7-158

- Install the drive gear into the housing and install the other inner bearing race and nut. Oil the bearings with Hypoid gear oil.
- Use special tool ③ to lock the gear, and special tool ④ to tighten nut to specification.

③	Secondary drive bevel gear holder	09924-54511
④	41 mm socket wrench	09910-23710



NOTE:
Always use a new nut.

Nut tightening torque:	12—15 kg-m (87.0—108.5 lb-ft)

BEARING PRELOAD ADJUSTMENT

- After tightening the nut to specification, rotate the drive gear several turns in both directions to seat the bearings.
- Use special tools ① through ④ to measure the torque necessary to turn the gear. This is the bearing preload. (Fig. 7-159)

①	Torque wrench 0—15 kg-cm	09900-21107
②	Adapter socket 12.7×6.3 mm	09915-24550
③	Adapter socket 12.7×19.0 mm	09915-24540
④	41 mm socket wrench	09910-23710

Preload:	3—5 kg-cm (2.60—4.35 lb-in)

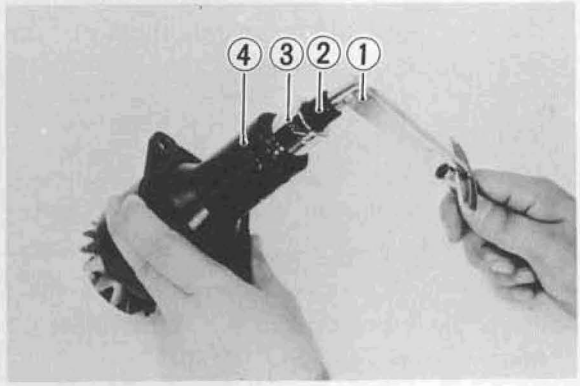


Fig. 7-159

If the bearing preload is not within specification, the shims between the bearings must be changed. Refer to the chart below and make appropriate adjustments, repeating the preload checking procedure as necessary.

NOTE:
Each time the preload is checked after a shim change, the gear must be rotated in both directions to seat the bearings after the nut is retorqued to specification.

Preload	Adjustment by shim
Under 3 kg-cm	Decrease shim thickness
3—5 kg-cm (2.60—4.35 lb-in)	Correct
Over 5 kg-cm	Increase shim thickness

List of shims

Part No.	Shim thickness
09181-32001	1.60 mm
09181-32002	1.62 mm
09181-32003	1.64 mm
09181-32004	1.66 mm
09181-32005	1.68 mm
09181-32006	1.70 mm
09181-32007	1.80 mm
09181-32008	1.90 mm
09181-32009	2.00 mm

- After the bearing preload has been adjusted to within specification, remove the drive gear nut, clean and degrease the threads on the drive gear shaft, install the nut, and torque to specification.

Nut tightening torque	12–15 kg-m (87.0–108.5 ft-lb)

- Bend the collar of the nut over into the notch in the drive gear shaft.
- Press a new plug into the secondary drive gear housing so that it is 1.5mm below the housing shoulder. (Fig. 7-160)

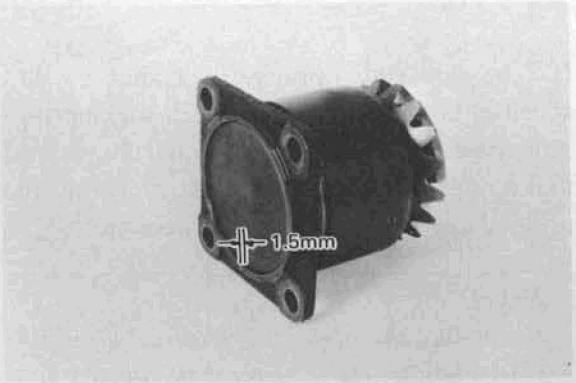


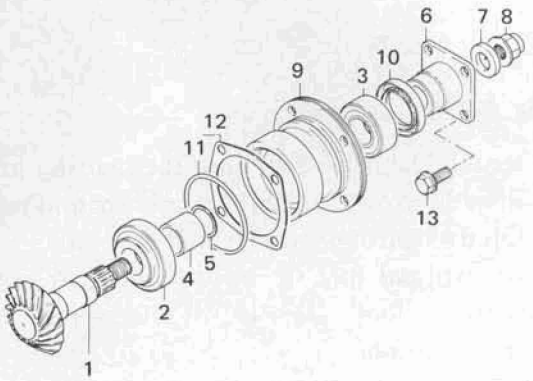
Fig. 7-160

- The secondary drive gear assembly is now ready for installation into the crankcase. For backlash and tooth contact adjustments, see section (7-46).

SECONDARY DRIVEN GEAR ASSEMBLY

REMOVAL AND DISASSEMBLY

- Remove drive unit cover and drain secondary gear oil into a pan.
- Remove the four secondary driven gear housing bolts and remove the assembly from the crankcase.



1. Secondary driven gear
2. Bearing
3. Bearing
4. Spacer
5. Shim
6. Universal joint flange
7. Washer
8. Nut
9. Driven gear housing
10. Oil seal
11. O ring
12. Shim
13. Bolt

Fig. 7-161

- Secure the propeller shaft flange in a vise and straighten the bent portion of the driven gear nut. Remove the nut. (Fig. 7-162)

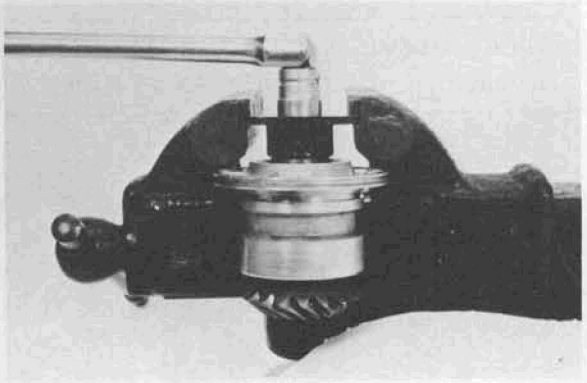


Fig. 7-162

- Remove the flange from the driven gear.
- Tap the driven gear with a plastic hammer to remove it from the housing.
- To remove the oil seal from the housing, use special tools ① and ② . (Fig. 7-163)

①	Bearing and oil seal remover	09941-64510
②	Rotor remover shaft set	09930-30102

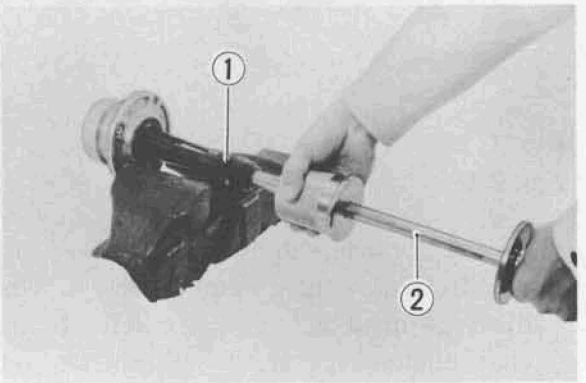


Fig. 7-163

- Remove the spacer and shims from the driven gear shaft. Do not discard them.
- Use special tool ③ to remove the inner bearing race from the driven gear. (Fig. 7-164)

Bearing inner race remover:	09941-84510

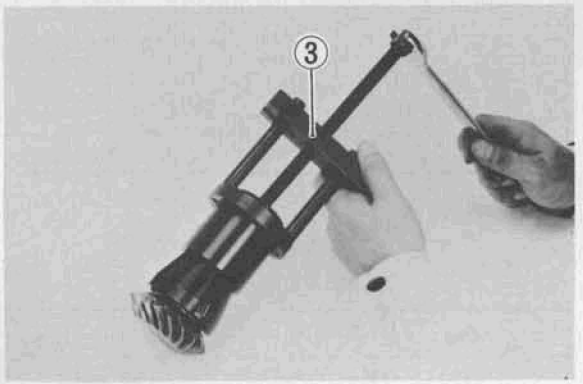


Fig. 7-164

- Use special tool ④ to remove the outer bearing races from the housing. (Fig. 7-165)

Bearing outer race remover:	09941-54911

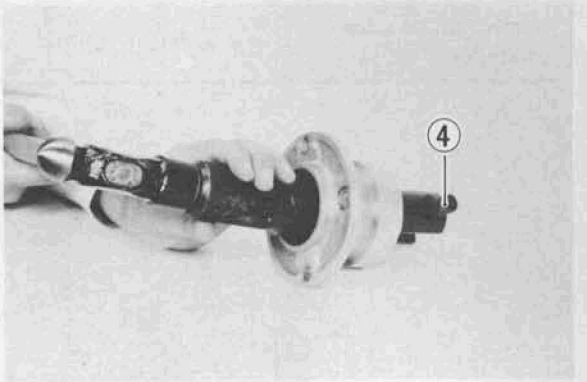


Fig. 7-165

INSPECTION AND REASSEMBLY

NOTE:
Before reassembly, clean all parts in solvent.

NOTE:
It will be helpful to have a selection of all shims available for bearing preload operation.

- Use special tool ① to install the outer bearing races into the secondary driven gear housing. (Fig. 7-166)

Bearing installer set:	09924-84510

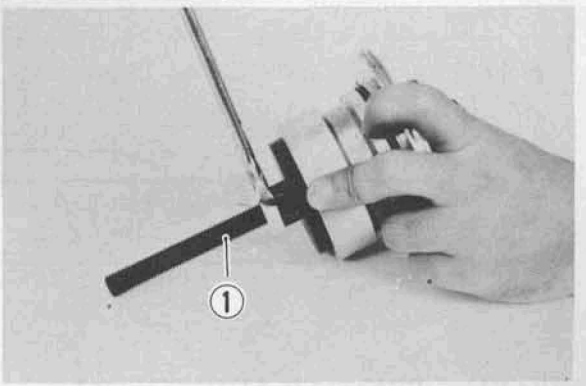


Fig. 7-166

- Use special tool ② to install the inner bearing race onto the driven gear. (Fig. 7-167)

CAUTION:
If replacing the secondary driven gear, be sure also to replace the secondary drive gear, as they must be replaced together.

Drive pinion race installer:	09913-80112

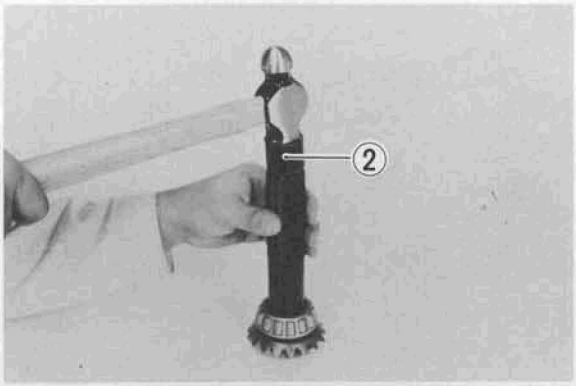


Fig. 7-167

- Install the spacer and shims, removed during disassembly, onto the driven gear shaft.
- Lubricate the bearings with Hypoid gear oil and install the secondary driven gear and bearings into the housing.

NOTE:
No oil seal is installed at this point. Oil seal is installed after bearing preload is correct.

- Install the propeller shaft flange, washer, and nut on the driven gear, and tighten the nut to specification.

NOTE:
Always use a new nut.

Nut tightening torque:	9.0—11.0 kg-m (65.0—79.5 lb-ft)

BEARING PRELOAD ADJUSTMENT

- After the nut is tightened to specification, turn the gear several turns in both directions to seat the bearings.
- Use special tools ① and ② and a socket to measure the torque necessary to turn the gear. This is the bearing preload. (Fig. 7-168)

①	Torque wrench 0—15 kg-cm	09900-21107
②	Adapter socket 12.7×6.3 mm	09915-24550

Preload:	4.0—7.0 kg-cm (3.45—6.05 lb-in)

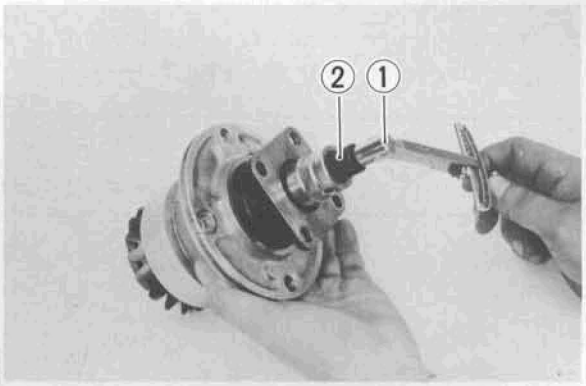


Fig. 7-168

- If the bearing preload is not within specification, the shims between the bearings must be changed. Refer to the chart below to make appropriate adjustments, repeating the preload checking procedure as necessary.

NOTE:
Each time the preload is checked after a shim change, the gear must be rotated in both directions to seat the bearings after the nut is retorqued to specification.

Preload	Shim Adjustment
under 4 kg-cm	decrease shim thickness
4-7 kg-cm (3.45-6.05 lb-in)	correct
over 7 kg-cm	increase shim thickness

List of shims

Part No.	Shim thickness
09181-25006	1.60 mm
09181-25007	1.62 mm
09181-25008	1.64 mm
09181-25009	1.66 mm
09181-25010	1.68 mm
09181-25011	1.70 mm
09181-25012	1.80 mm
09181-25013	1.90 mm
09181-25014	2.00 mm

- After the bearing preload has been adjusted to within specification, remove the driven gear nut, washer, and propeller shaft flange.
- Install a new oil seal into the secondary driven gear housing, making it flush with housing shoulder.
- Clean and degrease the driven gear shaft threads, apply a small amount of SUZUKI THREAD LOCK SUPER "1361A" to the threads, and install the propeller shaft flange, washer, and nut.

  Tighten the nut to specification.

SUZUKI THREAD LOCK SUPER "1333B"	99000-32020

Nut Tightening Torque	9.0-11.0 kg-m (65.0-79.5 ft-lb)

- Bend the collar of the nut over into the notch in the driven gear shaft.
- The secondary driven gear assembly is now ready for installation into the crankcase for backlash and tooth contact adjustments see section (7-46).

SECONDARY GEAR SET CLEARANCING OPERATIONS

BACKLASH

- Install the housing shims removed during disassembly onto secondary drive gear housing and secondary driven gear housing.

NOTE:
No o-rings are used at this stage.

- Install drive and driven gear housing into crankcase and tighten four bolts on each to specification. (Fig. 7-169, 7-170)

CAUTION:
Secondary drive and driven gear housings must be installed with letters "up" facing upward as shown in Fig. 7-169, 7-170.

Bolt tightening torque:	2.0—2.6 kg-m (14.5—19.0 lb-ft)

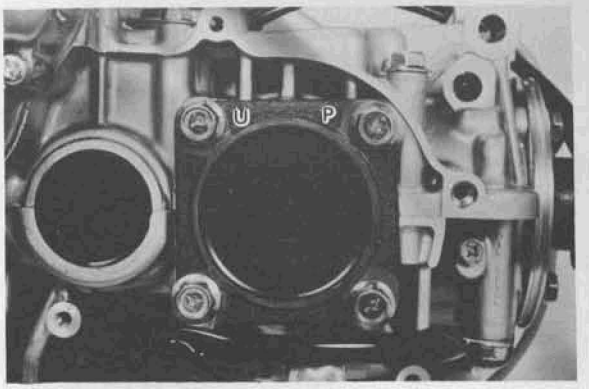


Fig. 7-169

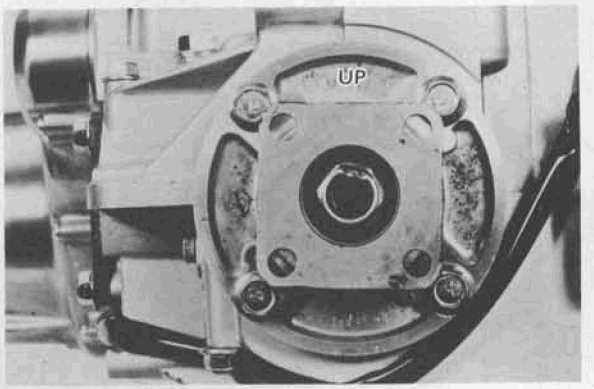


Fig. 7-170

- Attach a dial gauge as shown to the secondary driven gear flange and measure the backlash by turning the flange in each direction until it stops. (Fig. 7-171)

Secondary Driven Gear Backlash	0.08-0.13 mm (0.003-0.005 in)

Fig. 7-171

- If the backlash is not within specification, the shim between the secondary driven gear housing and crankcase must be changed and the backlash rechecked until correct. Refer to the table below for appropriate changes.

Blacklash	Shim adjustment
Under 0.08 mm	Increase shim thickness
0.08–0.13 mm (0.0031–0.0051 in)	Correct
Over 0.13 mm	Decrease shim thickness

List of Shims

Part No.	Shim thickness
24945-45100	0.35 mm
24945-45102	0.40 mm
24945-45103	0.50 mm
24945-45104	0.60 mm

TOOTH CONTACT CHECKING

- After bringing the backlash within specification by changing the shim between the secondary driven gear housing and crankcase, it will be necessary to check tooth contact.
- Remove the four bolts and remove the secondary driven gear housing from the crankcase.
- Clean and degrease the secondary driven gear teeth, and apply a coating of machinist's layout dye or paste to several teeth
- Reinstall the secondary driven gear housing, with correct shim, into the crankcase, and torque the bolts to specification.

NOTE: No o-ring is used at this stage.

Bolt Tightening Torque	2.0-2.6 kg-m (14.5-19.0 lb-ft)

- Shift the engine gearbox into 1st gear to provide load, and turn the secondary driven gear flange several turns in both directions.
- Remove the secondary driven gear housing from the crankcase, and observe the tooth contact pattern made in the dye or paste.
- Compare the tooth contact pattern to the examples in Figs. 7-172, 7-173, 7-174.

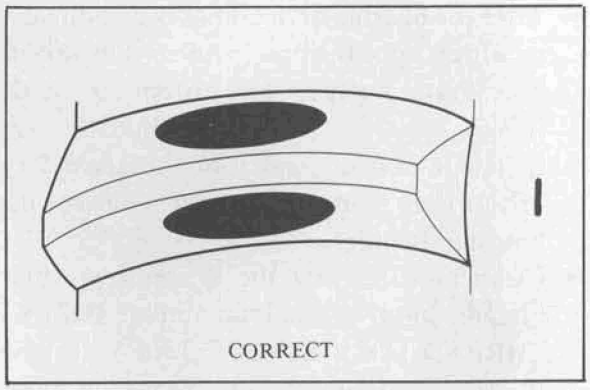


Fig. 7-172

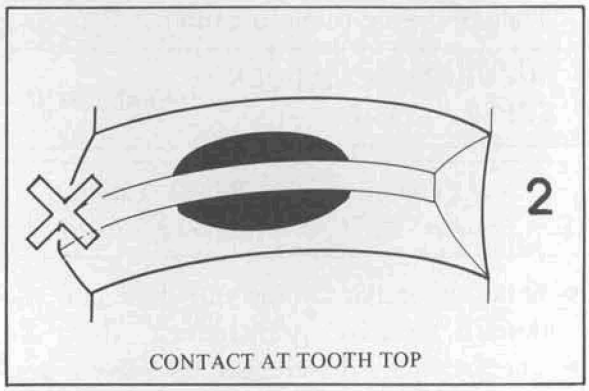


Fig. 7-173

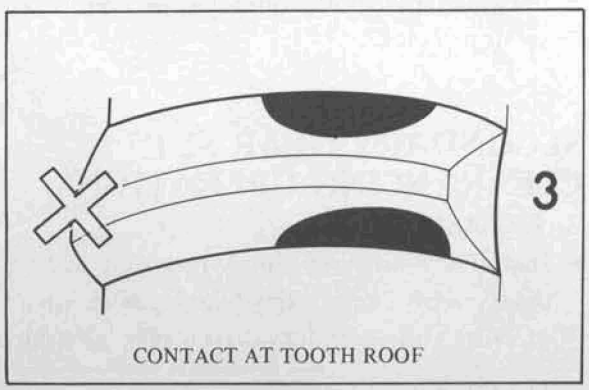


Fig. 7-174

- If tooth contact is found to be correct, go the Final Assembly sub-section, and complete.
- If tooth contact is found to be incorrect, the shim between the secondary drive gear housing and crankcase must be changed, and tooth contact rechecked, until correct.

Tooth contact	Shim thickness
Contact at tooth top	Decrease shim thickness
Contact at tooth roof	Increase shim thickness

List of shims

Part No.	Shim thickness
24935-45100	0.35 mm
24935-45102	0.40 mm
24935-45103	0.45 mm
24935-45104	0.50 mm

CAUTION:
After the tooth contact adjustment is made, the backlash must be rechecked, as it may change. Refer to the backlash checking subsection, and readjust until both backlash and tooth contact are correct.

FINAL ASSEMBLY

- After both gear backlash and tooth contact are correct, remove the secondary drive gear housing and secondary driven gear housing from the crankcase.
- Clean off any machinist's dye or past from the gear teeth, and lubricate the teeth with Hypoid gear oil.
- Install new O-rings on the secondary drive and driven gear housings. Lightly grease the O-rings.
- Install the secondary drive and driven gear housings into the crankcase.

NOTE:
Secondary drive and driven gear housings must be installed with the letters "UP" facing upward, as shown in Figs. 7-169, 7-170.

- Use SUZUKI THREAD LOCK "1342" on the threads of the housing bolts, and torque to specification.

Thread Lock "1342"	99000-32050

Bolt Tightening Torque	2.0-2.6 kg-m (14.5-19.0 lb-ft)

- Reinstall secondary gear drain plug and torque to specification.

Drain Plug Torque	2.0-3.0 kg-m (14.5-21.5 lb-ft)

- Fill the gear cavity to specified capacity, 340–400 ml (11.5–13.5 US oz) with Hypoid gear oil.
- Reinstall swing arm with propeller shaft and rear wheel see section (11-39 and 11-43)
- Reinstall secondary drive gear outer cover.

EXTERNAL MECHANISM FOR GEAR SHIFT

REMOVAL

- Remove gear shift lever.
- Remove clutch cover and primary driven gear (see page 7-35).
- Extract gear shift shaft from crankcase.

INSTALLATION

- Installation is carried out in the reverse order of removal.
- Install the gearshift shafts, with the center of the gear on shaft side aligned the center of gearshift cam driven gear.

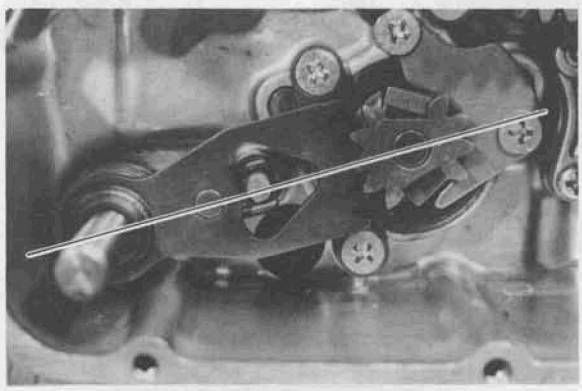


Fig. 7-175

- Install clutch driven gear and clutch cover.
- Replace gasket with a new one to prevent oil leakage.

ENGINE LUBRICATION SYSTEM

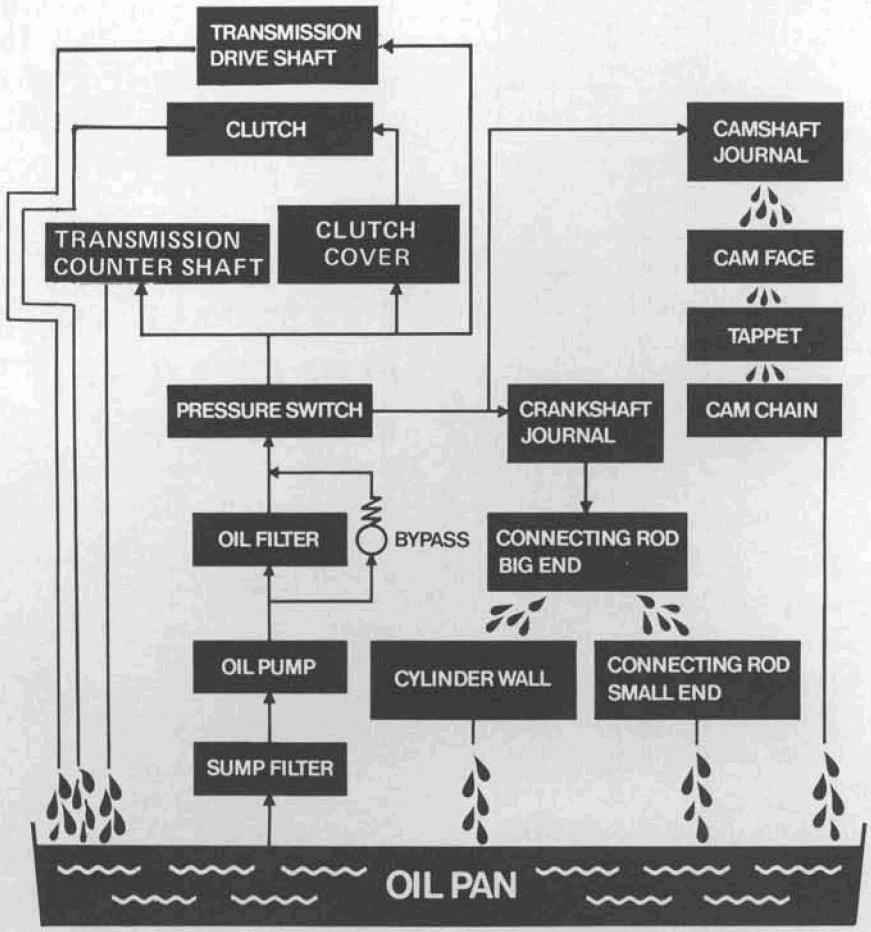


Fig. 7-176

OIL PUMP

REMOVAL

- Remove clutch cover and primary driven gear (see page 7-35).
- Remove oil pump drive gear, needle bearing and spacer.
- Remove the circlip of oil pump gear and then the gear.
- Remove three oil pump mounting bolts and remove oil pump body from crankcase.
- Remove one screw fastening oil pump body and extract pin securing the lower case and the upper case.

Fig. 7-177

INSPECTION

OUTER ROTOR CLEARANCE IN THE BODY

Use a thickness gauge.

Outer rotor clearance

Service Limit	0.25 mm (0.010 in)

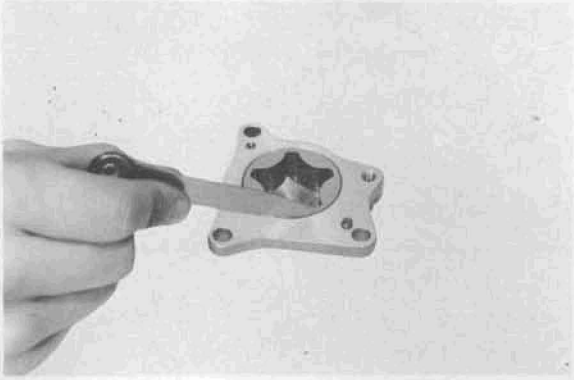


Fig. 7-178

TIP CLEARANCE

This is the clearance between inner rotor and outer rotor. Use a thickness gauge.

Tip clearance

Service Limit	0.20 mm (0.008 in)

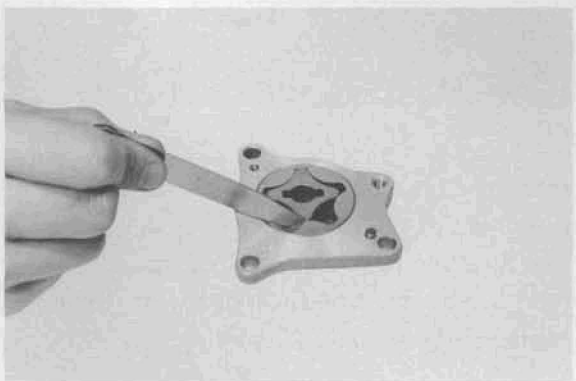


Fig. 7-179

SIDE CLEARANCE

Put a straightedge to the pump and measure the clearance under the straightedge, as shown. (Fig. 7-180)

Side clearance

Service Limit	0.15 mm (0.006 in)

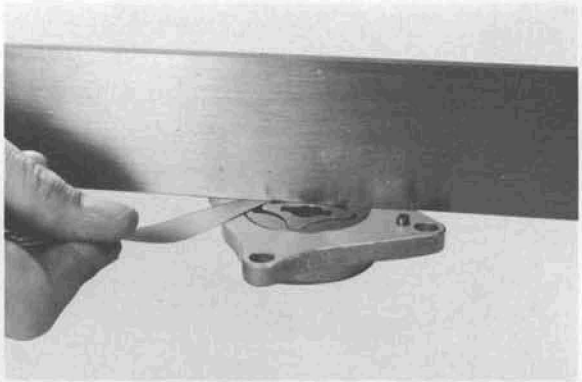


Fig. 7-180

INSTALLATION

- Installation is carried out in the reverse order of removal.
- Thoroughly wash the oil pump, inner and outer rotors and oil pump case with solvent and apply engine oil to them before inserting them into case.
  Since there are no identification marks for the upper or lower portions of the inner rotor and outer rotor, the rotor can be inserted irrespective of these portions.
- Replace circlip with new one.
- Apply THREAD LOCK "1342" (99000-32050) to one screw fastening oil pump body. Wipe off oil completely.

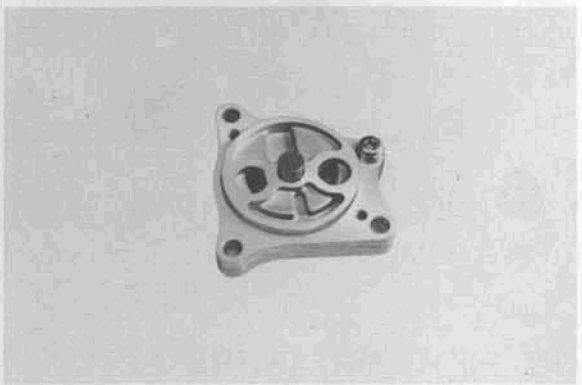


Fig. 7-181

- Be sure to place two "O" rings, mounted on the crankcase side, into "O" ring groove. It is advisable to apply grease to "O" ring to prevent it from falling off.

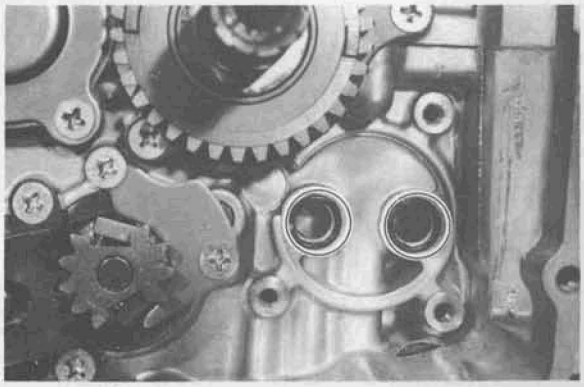


Fig. 7-182

- Apply THREAD LOCK "1363C" (99104-32050)to three screws and secure oil pump body (wipe oil off completely).
  At this time make sure that oil pump gear rotates smoothly.

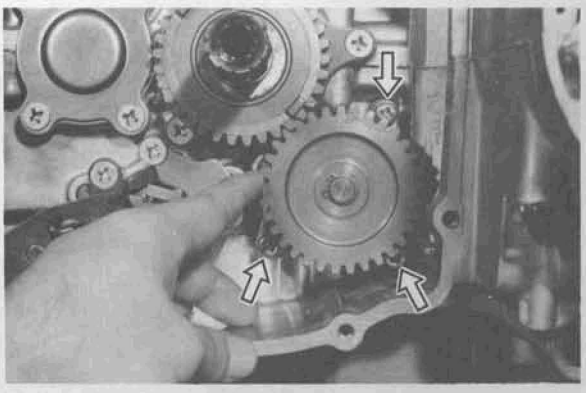


Fig. 7-183

- Reinstall primary driven gear, clutch, clutch cover, etc.

OIL PUMP PRESSURE TEST

Fig. 7-184

Start the engine and check if the oil pump pressure indicator light is turned on. If it keeps on lighting, check the oil pump pressure indicator light circuit. If it is in good condition, check the oil pump pressure in the following manner:

- Install the oil pressure gauge ① in the position shown in the figure.
- Warm up the engine as follows:
  Summer 10 min. or so at 2 000 r/min
  Winter 20 min. or so at 2 000 r/min
- After warming up operation, increase the engine speed to 3 000 r/min, and read the oil pressure gauge.
- The oil pump pressure is specified below:

Oil pump pressure:
Above 0.1 kg/cm² (1.4 psi), Below 0.5 kg/cm² (7.1 psi) at 3 000 r/min

Oil pressure gauge:	09915-74510

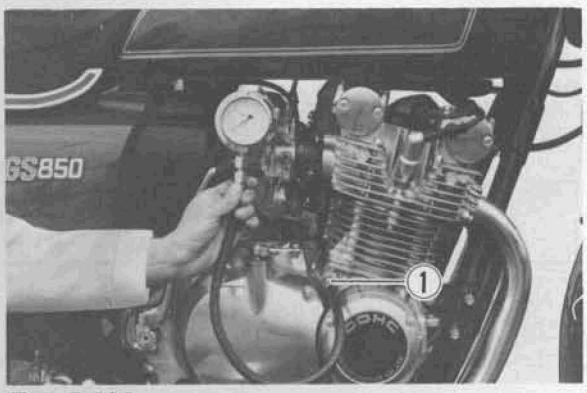


Fig. 7-185

If the pressure is too low, it means that the oil pump is internally worn or otherwise defective and needs to be overhauled. If inner parts are found to be worn down to or beyond the limit, replace the complete oil pump unit.

OIL FILTER

REMOVAL

Replace the oil filter with a new one in the following manner.

- Place an oil pan under the engine.
- Remove three nuts ① securing the filter cap ②.
- Take off the cap ②, pull out the old element.

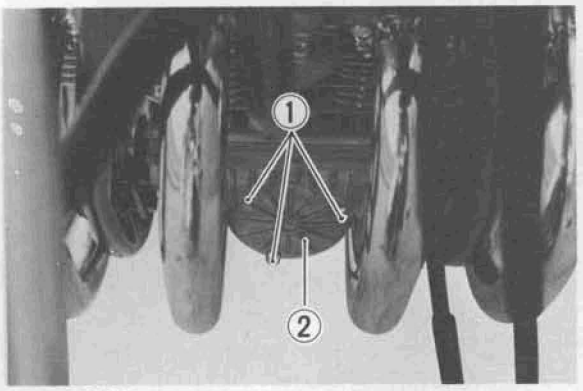


Fig. 7-186

INSTALLATION

Oil filter installation

- This package contains a rubber seal ring in addition to the oil filter. When replacing the oil filter, be sure to also replace the seal ring to ensure oil-tightness.
- In fitting the seal ring to the filter chamber cap, lightly apply grease on the seal ring groove to avoid any chance of dropping or mislocating the ring during the installation work.

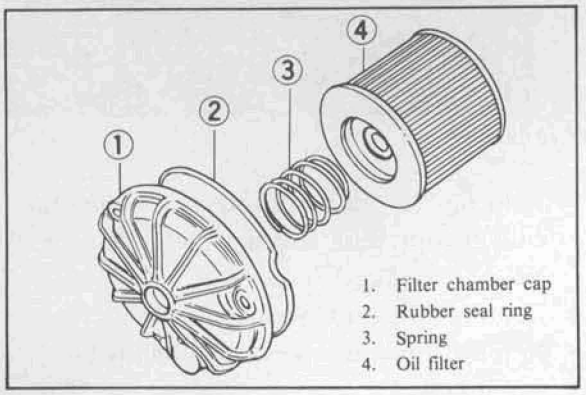


Fig. 7-187

- Put on the cap ① and secure it tightly.
- Install oil drain plug.

SUMP FILTER

REMOVAL

- Remove screws of oil pan ① and remove the oil pan from crankcase.

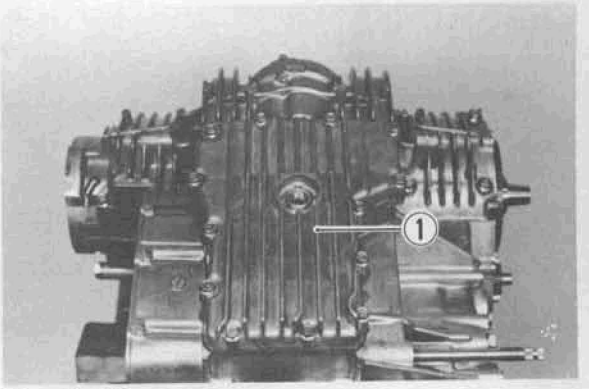


Fig. 7-188

- Remove three screws and then sump filter.

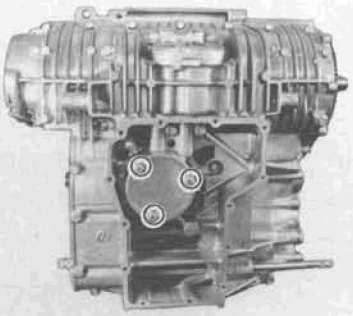


Fig. 7-189

INSTALLATION

- Thoroughly wash the sump filter with solvent and fasten it with three screws.

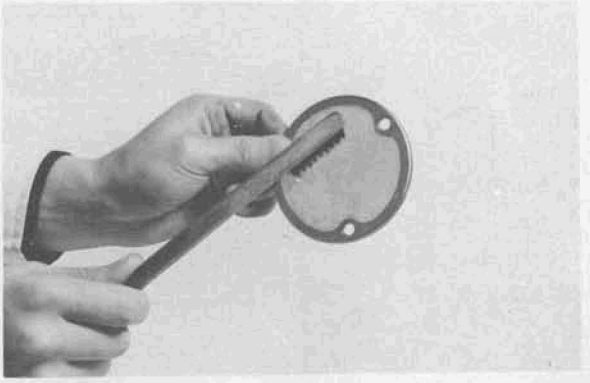


Fig. 7-190

- Install oil pan and tighten screws.
- Replace gasket with a new one to prevent oil leakage.

Tightening torque:	0.6—0.9 kg-m (4.5—6.5 lb-ft)

NOTE:
Pour about 3.6 L (3.8 US qt) of engine oil into oil pan only when changing oil and replacing oil filter at the same time.

CRANKCASE

REMOVAL

- Remove two bolts, and lightly hammer the head of starter motor gear with plastic hammer to remove starter motor.

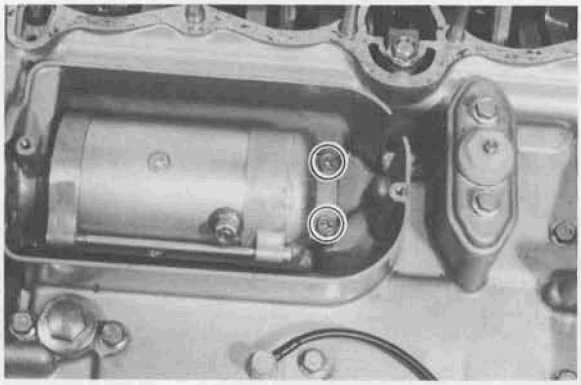


Fig. 7-191

- Pull out the spring guide ① mounted on the kick starter shaft, and remove the spring ② .

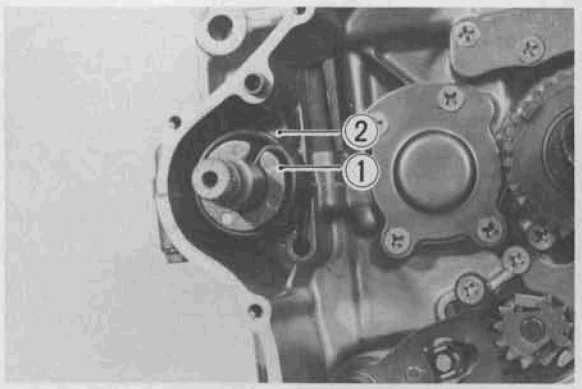
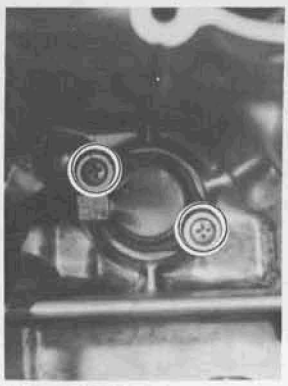


Fig. 7-192

- Remove two bolts and then oil seal holder.
- Remove two screws and then gear shifting switch body.



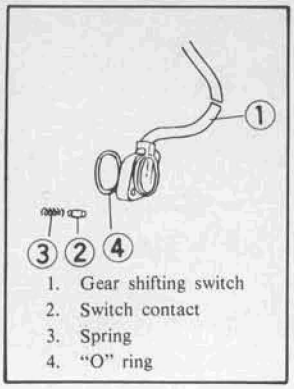


Fig. 7-193

- Remove the secondary drive bevel gear assembly from the crankcase. (See page 7-39).
- Remove the secondary driven bevel gear assembly from the crankcase. (See page 7-42).
- Gear shift cam guide screw ①
  . . . . . 2 pcs. (overall length 12 mm)
  Gear shift pawl screw ②
  . . . . . 2 pcs. (overall length 12 mm)
  Counter shaft B/g retainer screw
  . . . . . 3 pcs. (overall length 16 mm)
  Drive shaft plate screw
  . . . . . 4 pcs. (overall length 16 mm)
  Oil pump gallery plate screw
  . . . . . 3 pcs. (overall length 16 mm)

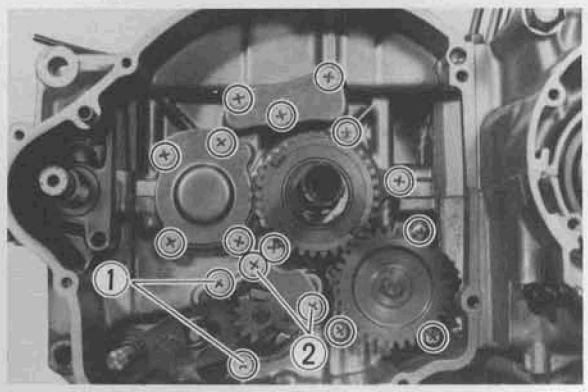


Fig. 7-194

- Remove the gear shifting shaft and then cam driven gear shifting pawls No.1 and No.2.
- Remove oil pump (See page 7-48).
- Remove upper crankcase tightening bolts.
  6 mm bolt. . . . . 12 pcs.
  8 mm bolt. . . . . 4 pcs.

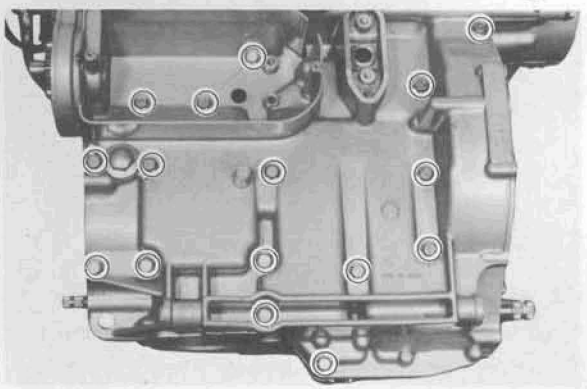


Fig. 7-195

- Next turn engine upside down to remove oil pan from lower crankcase (see page 7-51).
- After removal of oil pan, remove lower crankcase tightening bolts.
  6 mm bolt . . . . . 11 pcs.
  8 mm bolt . . . . . 13 pcs.

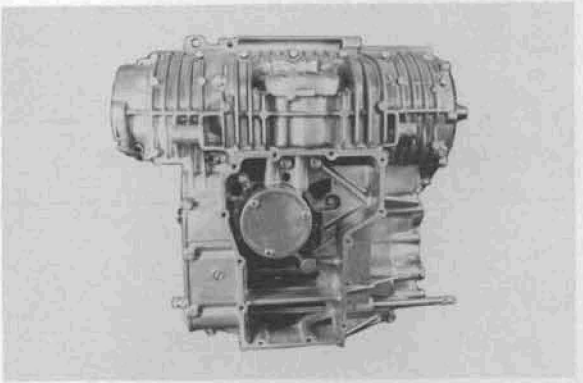


Fig. 7-196

- Make sure that bolts are removed. Lightly hammer the lower crankcase side with a plastic hammer to separate the upper and lower crankcase halves and then lift the latter.
- Remove the crankshaft sub-assembly, counter shaft gear and drive shaft gear which are all mounted on the upper crank case.
  At this time be careful not to drop "C" rings and the like.

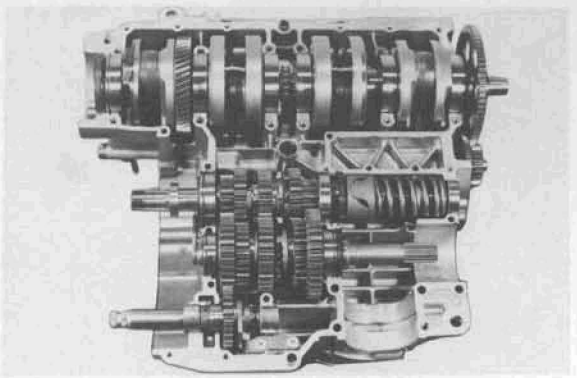


Fig. 7-197

- Hold gear shifting forks by hand to extract gear shifting fork shafts from the lower crankcase.

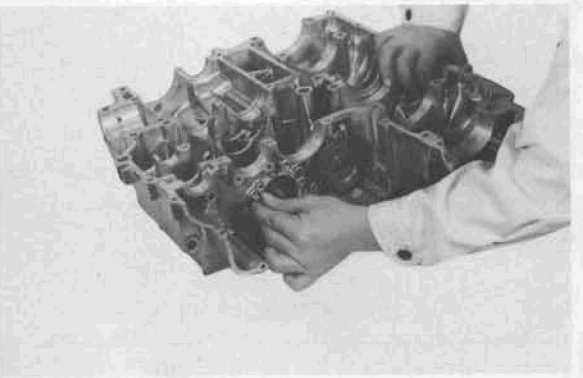


Fig. 7-198

- Remove cam stopper holder to remove cam stopper and spring.

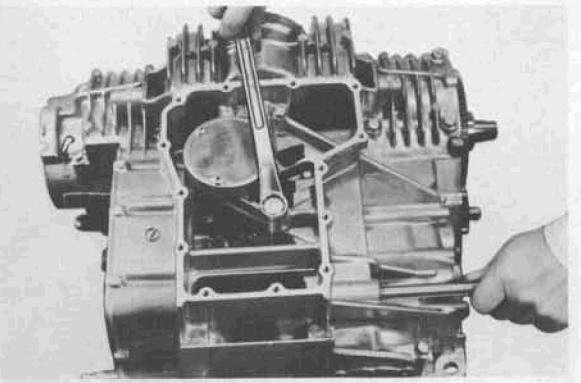


Fig. 7-199

- Extract gear shifting cam to the right side.

CRANKSHAFT

INSPECTION

Big end side clearance

Measure the big end side clearance of the connecting rod with a thickness gauge as shown. Replace the crankshaft if the clearance exceeds the limit.

Big end side clearance

Standard	Limit
0.10—0.55 mm (0.004—0.026 in)	1.0 mm (0.039 in)

Thickness gauge:	09900-20803

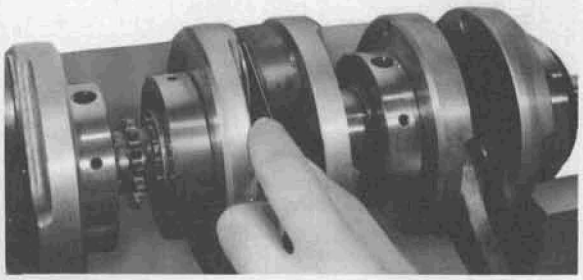


Fig. 7-200

Connecting rod big end wear

Support the crankshaft at both ends with V-blocks, and measure the amount of wear on the connecting rod big end. If worn more than specification, replace the crankshaft.

Connecting rod big end wear

Service Limit	0.08 mm (0.003 in)

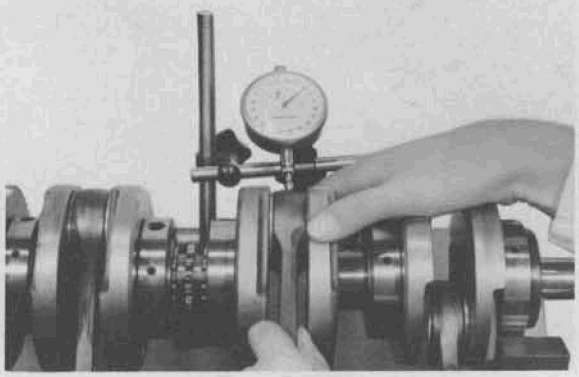


Fig. 7-201

Crankshaft runout

Support the crankshaft with "V" blocks as shown, with the two end bearings resting on the blocks. Rig up the dial gauge, as shown, and rotate the crankshaft slowly to read the runout.

Replace the crankshaft if the runout is greater than the limit.

Crankshaft runout

Service Limit	0.05 mm (0.002 in)

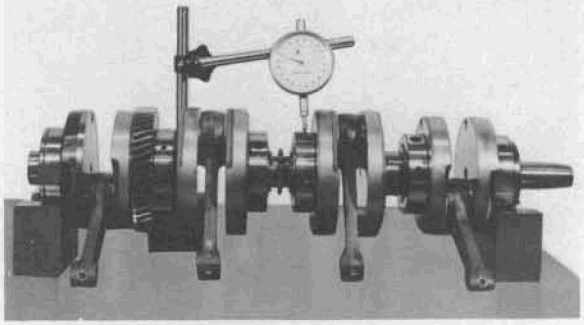
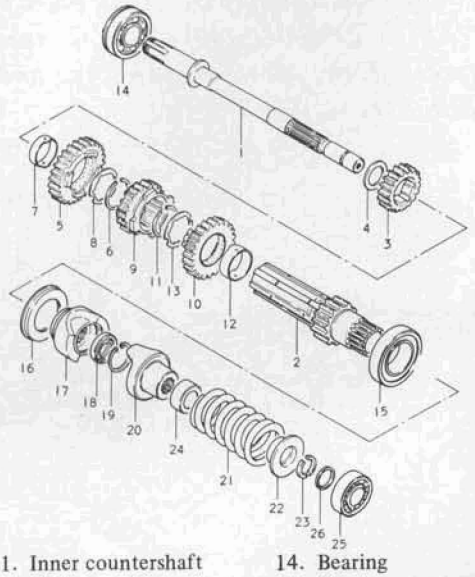


Fig. 7-202

TRANSMISSION

- Counter shaft gear assembly



1. Inner countershaft
2. Outer countershaft
3. 2nd drive gear
4. Washer
5. 5th drive gear
6. Circlip
7. Spacer
8. Lock washer
9. 3rd drive gear
10. 4th drive gear
11. Circlip
12. Spacer
13. Lock washer
14. Bearing
15. Bearing
16. Oil seat
17. Output cam dog
18. Oil seal
19. Circlip
20. Input cam dog
21. Spring
22. Sliding stopper
23. Stopper
24. Spring guide
25. Bearing
26. Spacer

Fig. 7-203

REMOVAL

- Remove the bearing and spacer, compress the spring with the special tool ①, and remove two stoppers ②.

Dog cam stopper set tool:	09924-44511

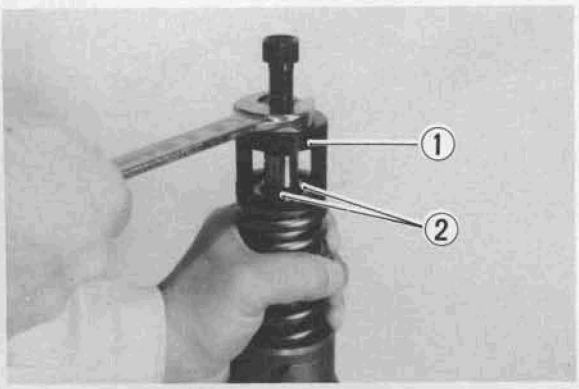


Fig. 7-204

INSTALLATION

NOTE:
- *Before installing the shafts and gears, wash them in a cleaning solvent.*
- *Before mounting the gears on the outer shaft, apply the engine oil to the gear bore.*

- For gear installation, refer to Fig. 7-203. (Be sure that the gears and spacers are correctly mounted facing in the correct direction.)
- Always use new circlips.
- Align the oil hole in the spacer ③ with that in the outer counter shaft, and mount the spacer on the shaft.

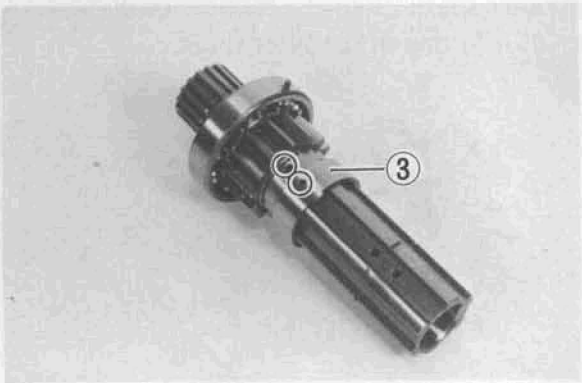


Fig. 7-205

- Install the locating washer to the spacer dogs.
- Take special care so that the circlip is correctly installed, fit it to the side where the thrust is as shown in the figure.

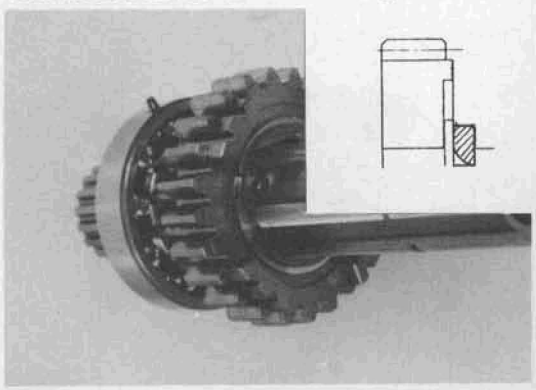


Fig. 7-206

- Spline the 3rd drive gear to the outer shaft so that the oil hole in the shift fork groove is aligned with the oil hole in the outer shaft.

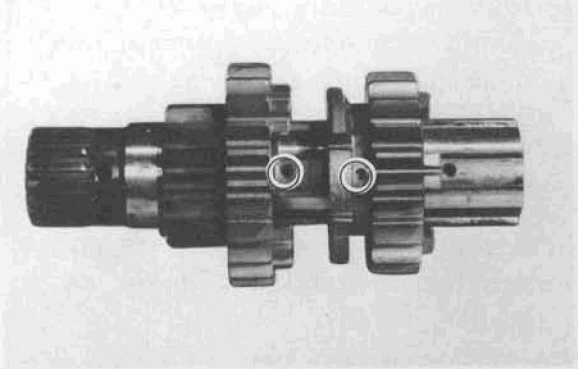


Fig. 7-207

- Before mounting the 5th drive gear on the outer shaft, align the oil hole in the spacer ① with that in the outer shaft.

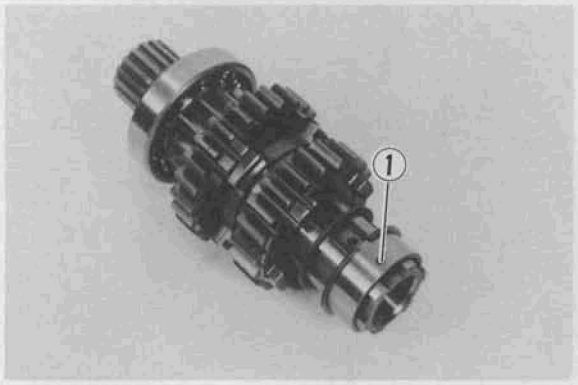


Fig. 7-208

- When installing the 5th drive gear spacer on the outer shaft, be sure that the spacer faces in the correct direction.

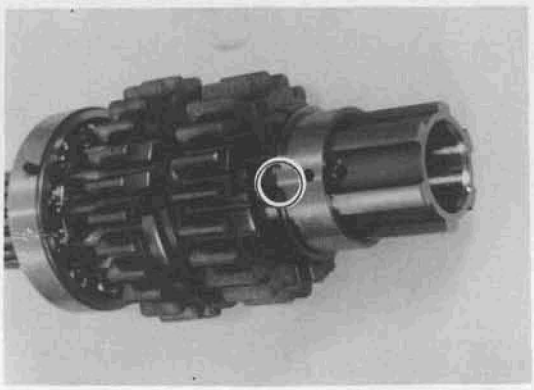


Fig. 7-209

NOTE:

- *Mount the 2nd drive gear on the outer counter shaft, apply SUZUKI MOLY PASTE (99000-25140) to both surfaces of the washer sparingly, and install the washer.*

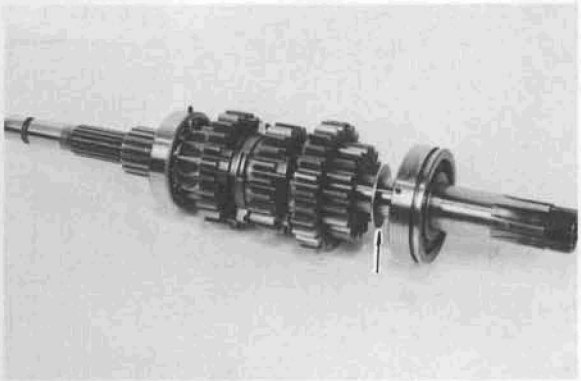


Fig. 7-210

- *Sparingly apply SUZUKI MOLY PASTE (99000-25140) to the area of the outer counter shaft bore, 20 to 30 mm (0.8 – 1.2 in) from each end of the shaft. Oil bearing surfaces on inner countershaft.*

- Now install inner shaft into outer shaft.
- Mount the output cam dog on the outer counter shaft.
  Align the cut on the cam dog with the oil hole in the counter shaft.

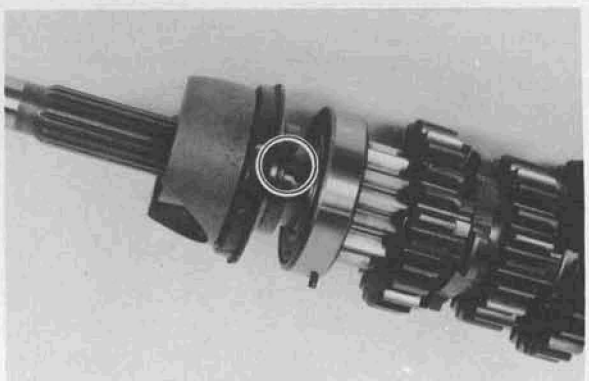


Fig. 7-211

- Next, apply SUZUKI MOLY PASTE (99000-25140) to the splines of the input cam dog, and mount it on the inner counter shaft.

- Mount the spring, spring guide, and sliding stopper on the inner counter shaft, and compress the spring with the special tool ①, and install the two stoppers.

Dog cam stopper set tool:	09924-44511

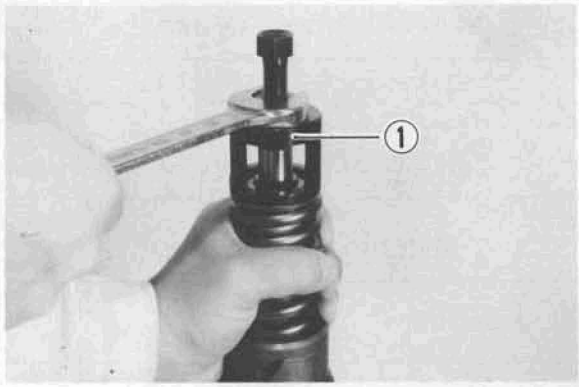
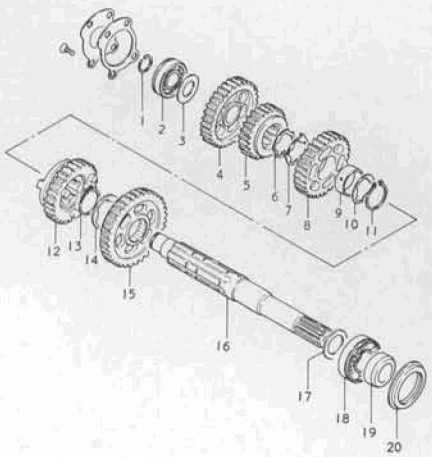


Fig. 7-212

DRIVE SHAFT GEAR

ASSEMBLY



1. Circlip
2. Bearing
3. Washer
4. 2nd driven gear
5. 5th driven gear
6. Washer
7. Lock washer
8. 3rd driven gear
9. Bushing
10. Washer
11. Circlip
12. 4th driven gear
13. Circlip
14. Washer
15. 1st driven gear
16. Drive shaft
17. Washer
18. Bearing
19. Spacer
20. Oil seal

Fig. 7-213

INSTALLATION

- See the above drawing with respect to the assembly of each gear (pay attention to the gear's direction).
- Always use new circlips.

NOTE:
Order of mounting of spacer ⑨, washer ⑩, circlip ⑪, 3rd driven gear ⑧, lock washer ⑦, and washer ⑥.

- Mount the circlip ⑪ and washer ⑩ on the drive shaft, in that order.
  Temporarily position the circlip beyond the groove.
- Align the hole in the spacer ⑨ with the oil hole in the drive shaft, and install the 3rd driven gear.

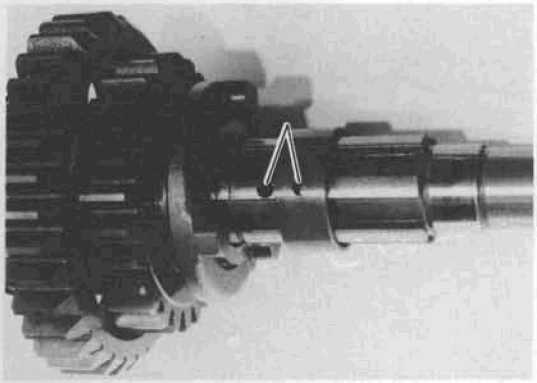


Fig. 7-214

- Mount the lock washer ⑦ and washer ⑥ on the drive shaft, in that order, and by turning the washer in or out, align the lock washer tongue with the cut on the washer.

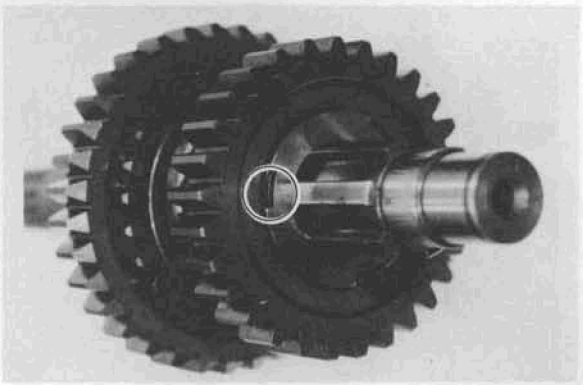


Fig. 7-215

- Fit the circlip in the groove on the drive shaft, using the special tool ①. (Fig. 7-216)

Snap ring pliers:	09900-06106

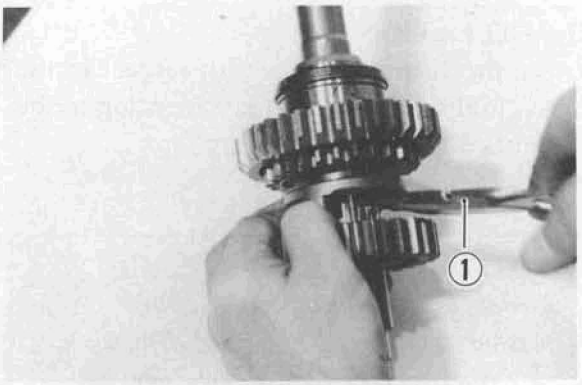


Fig. 7-216

- Take special care so that the circlip is correctly installed.

  Fit it to the side where the thrust is as shown in the figure.

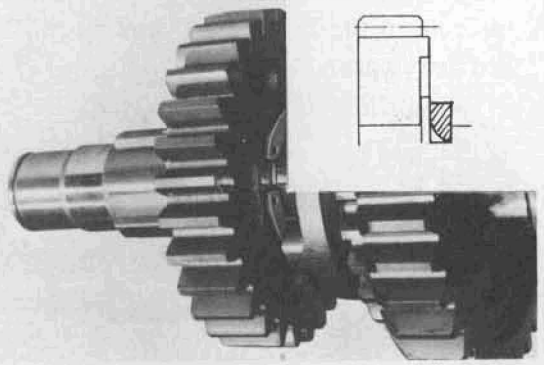


Fig. 7-217

- There is an oil hole in the shift fork groove for the 5th driven gear. When installing the 5th driven gear, this oil hole must be aligned with the oil hole in the drive shaft. The 5th driven gear is subjected to special surface treatment for better wear resistance and thus it is colored black.

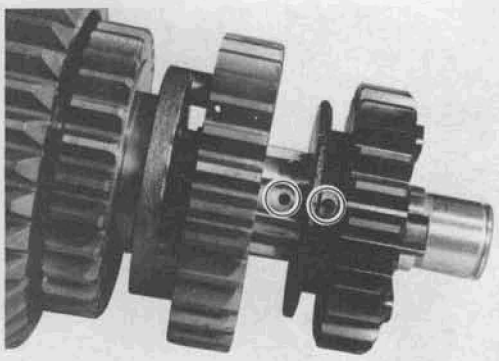


Fig. 7-218

INSPECTION

Shift fork—Groove clearance

- Using a thickness gauge, measure the fork groove clearance. If it exceeds the limit, check the amount of wear on both gear and shift fork using vernier calipers, and replace either one that has greater wear.

Shift fork-Groove clearance

Standard	Limit
0.4—0.6 mm (0.016—0.024 in)	0.8 mm (0.031 in)

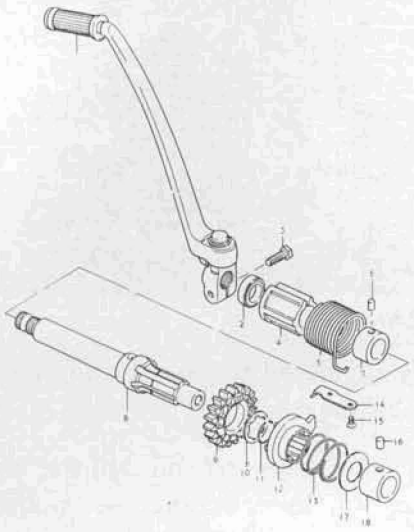
Shift fork groove width

Standard:	5.45—5.55 mm (0.215—0.219 in)

Shift fork thickness

Standard:	4.95—5.05 mm (0.195—0.199 in)

KICK SHAFT



1. Kick starter lever
2. Oil seal
3. Bolt
4. Spring guide
5. Spring
6. Dowel pin
7. Bushing
8. Kick starter shaft
9. Kick starter drive gear
10. Washer
11. Circlip
12. Kick starter
13. Spring
14. Starter guide
15. Screw
16. Dowel pin
17. Plate
18. Bushing

Fig. 7-220

- For installation, refer to the illustration above.
- Align the punch mark on the kick starter with that on the kick starter shaft, and install the kick starter.

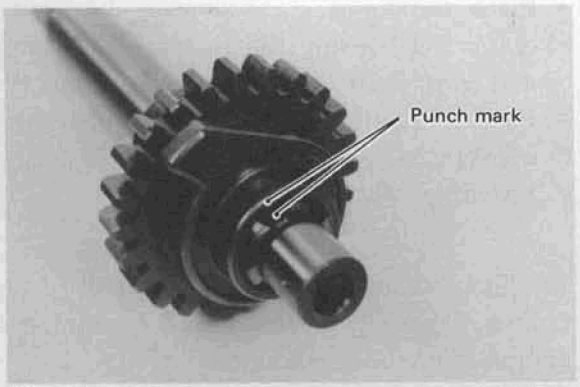


Fig. 7-221

NOTES ON INSTALLATION OF TRANSMISSION GEARS AND CRANKSHAFT IN CRANKCASE

- Thoroughly wash the upper crankcase and the lower crankcase with solvent to remove any sealing compound.
- Firmly insert crankshaft locating "pins" ①, transmission gear locating "C" rings ② for bearings on both sides and locating pin ③.

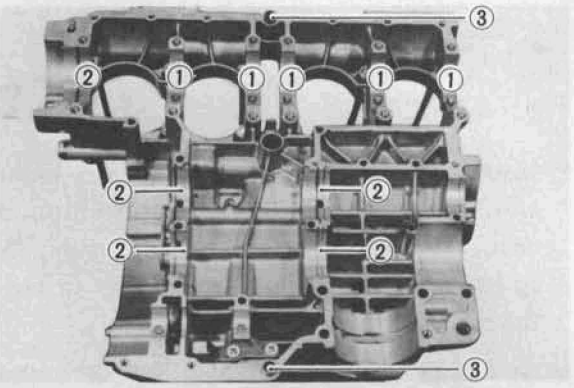


Fig. 7-222

- Mount crankshaft and transmission shaft assemblies on the upper case. At this time firmly fit the bearing races onto the locating pins with punch mark stamped on the circumference of the bearings directed upwards.

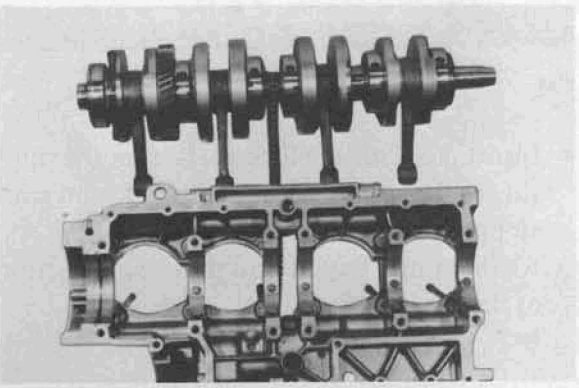


Fig. 7-223

- Use the "C" rings and bearing stopper pins to position the bearings as shown in the photo.

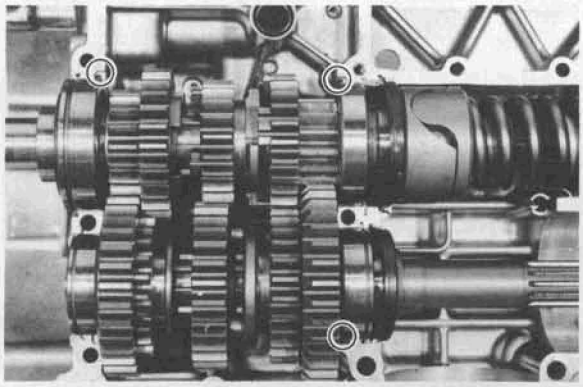


Fig. 7-224

- Insert gear shifting cam into the lower crankcase. Confirm the neutral position of gear shifting cam, mount cam stopper, spring and cam stopper holder and fasten the cam stopper holder.

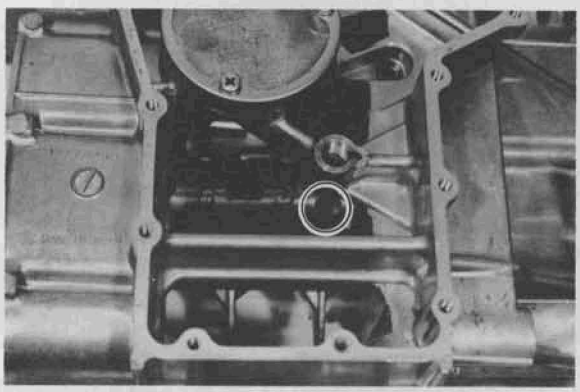


Fig. 7-225

- Insert gear shifting fork shaft from the right side and mount gear shifting fork and cam stopper as shown in the photo.
  At this time, pay attention to the direction of the gear shifting fork.

① Gear shifting fork for 3rd drive gear.
② Gear shifting forks for 4th and 5th driven gears.
③ Cam stopper.

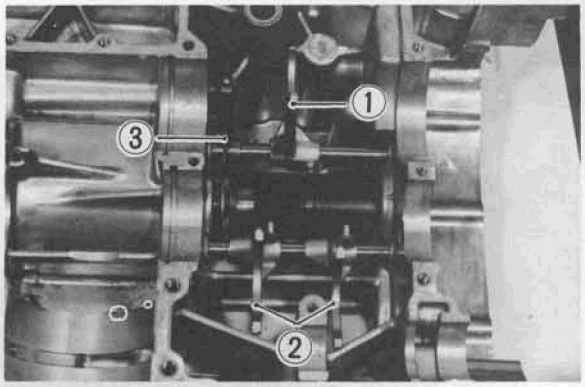


Fig. 7-226

- Apply engine oil to gear shifting fork and gear shifting cam.
- Completely wipe off oil on the mating surface of lower crankcase and apply sealing compound (SUZUKI BOND NO. 1207B; 99104-31140) uniformly to the mating surface.
- Do not forget "O" ring ①.

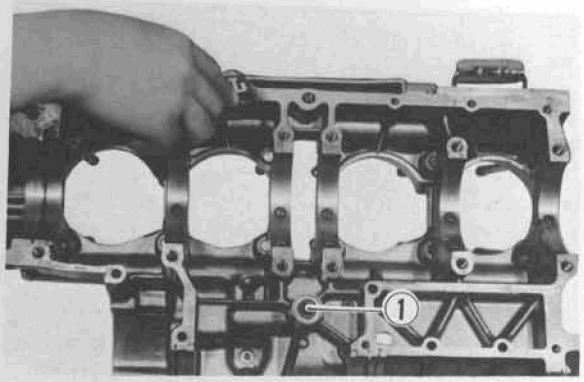


Fig. 7-227

- Place the lower crankcase on the upper crankcase housing the transmission gears and crankshaft. Align shift forks into gears.
- Fasten together the upper and lower crankcase halves using the crankcase fastening bolts.

The lower crankcase fastening bolts must be tightened securely in the order of the numbers embossed on the crankcase.

6 mm bolt . . . . . 11 pcs.
8 mm bolt . . . . . 13 pcs.

Tightening torque for 8-mm bolts	2.0 kg-m (14.5 lb-ft)
Tightening torque for 6-mm bolts	1.0 kg-m (7.2 lb-ft)

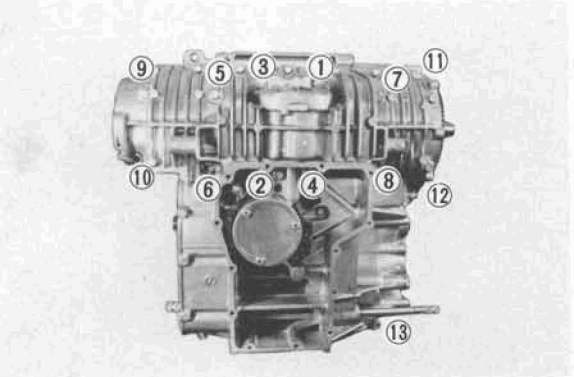


Fig. 7-228

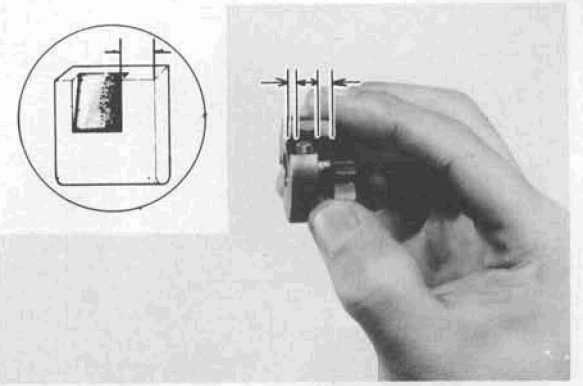


Fig. 7-229

- Turn the crankcase over so that the cylinder studs are up and tighten the upper crankcase bolts.
  6 mm bolt . . . . . 12 pcs.
  8 mm bolt . . . . . 4 pcs.

Tightening torque for 8-mm bolts	2.0 kg-m (14.5 lb-ft)
Tightening torque for 6-mm bolts	1.0 kg-m (7.2 lb-ft)

NOTE:

- *When the secondary bevel gear is installed, the offset at the mating surfaces of the crankcase halves, upper and lower, should be 0.1 mm or less.*
- *Thoroughly wipe off any overflow of the sealing compound applied to the mating surfaces of crankcase before installing the secondary bevel gear assemblies.*
  Take special care not to scratch inner surfaces of the crankcase.
- *The shape of each gear shifting pawl is different. Mount the one with the narrower width on the gear shifting cam side.*

SHAFT DRIVE

CONTENTS

FINAL DRIVE BEVEL GEAR ASSEMBLY 8- 4
FINAL GEAR CASE BREATHER CIRCUIT 8- 6
REMOVAL AND DISASSEMBLY 8- 7
INSPECTION AND REASSEMBLY 8- 9
FINAL DRIVE GEAR PRELOAD ADJUSTMENT 8-10
FINAL DRIVEN GEAR ASSEMBLY 8-11
FINAL GEAR BEARING COVER SHIM ADJUSTMENT 8-13
BACKLASH MEASUREMENT 8-13
TOOTH CONTACT ADJUSTMENT 8-14
FINAL ASSEMBLY 8-15
INSTALLATION OF PROPELLER SHAFT AND
FINAL DRIVE GEAR ASSEMBLY 8-16

SHAFT DRIVE

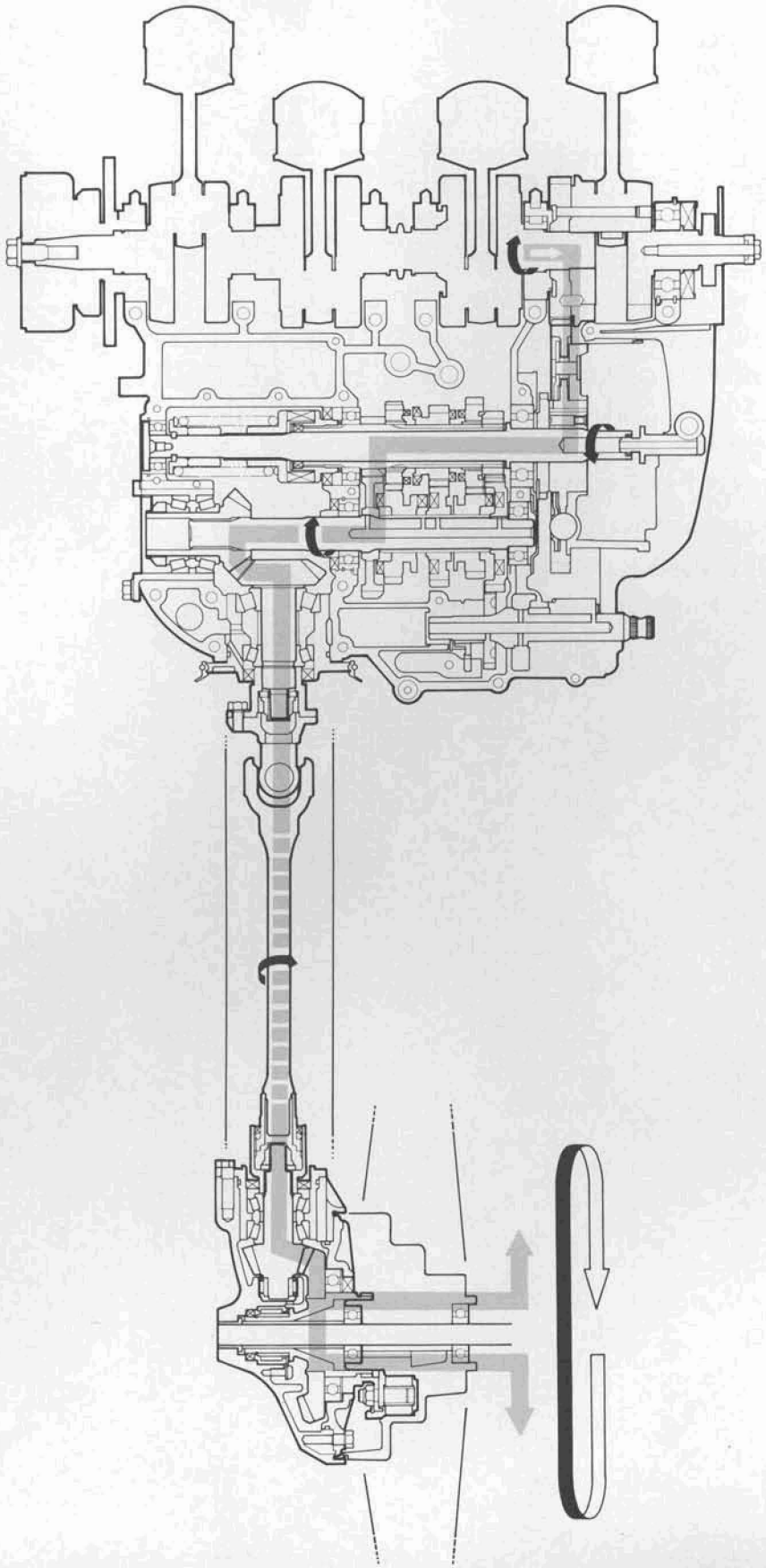


Fig. 8-1

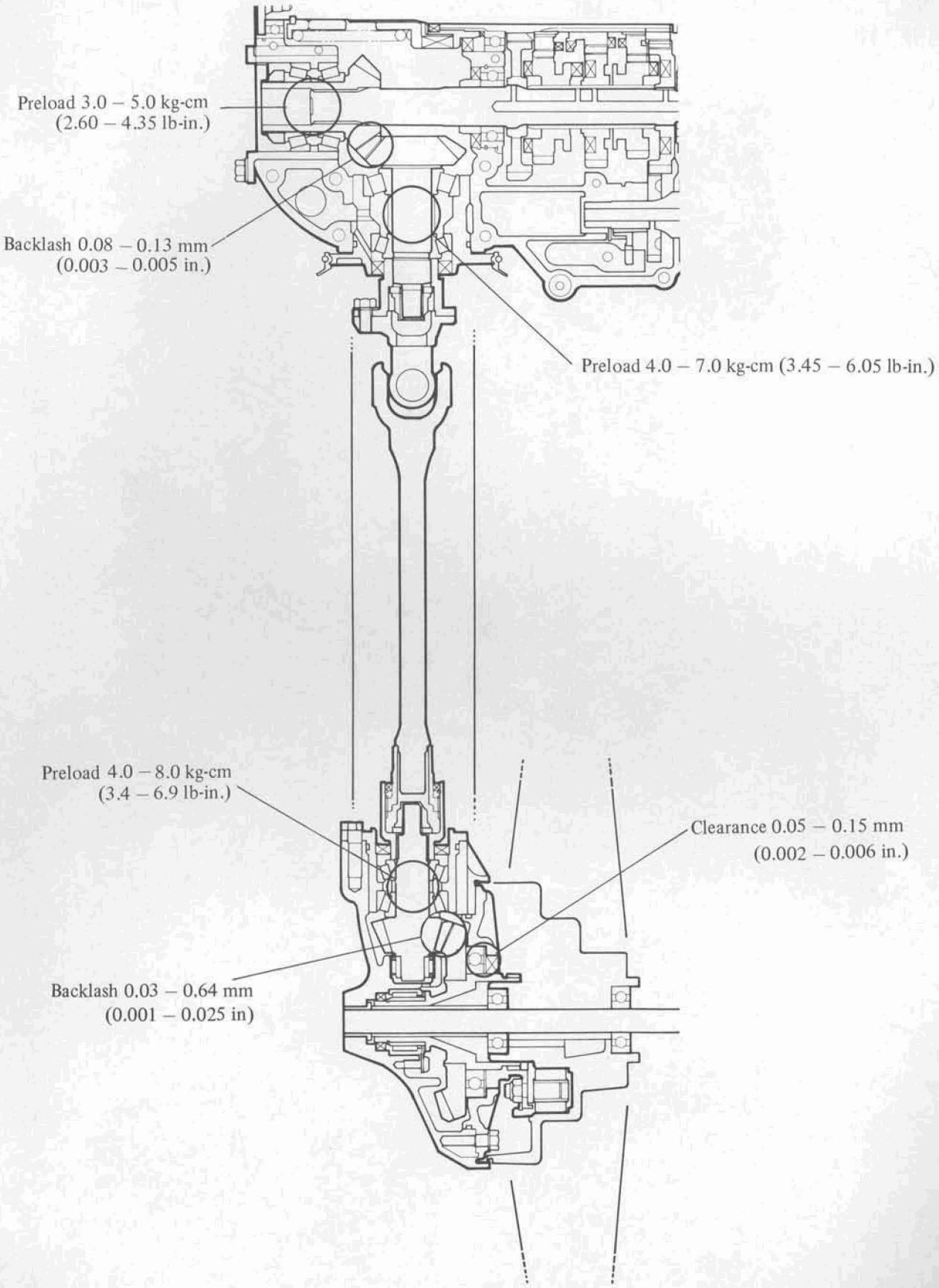
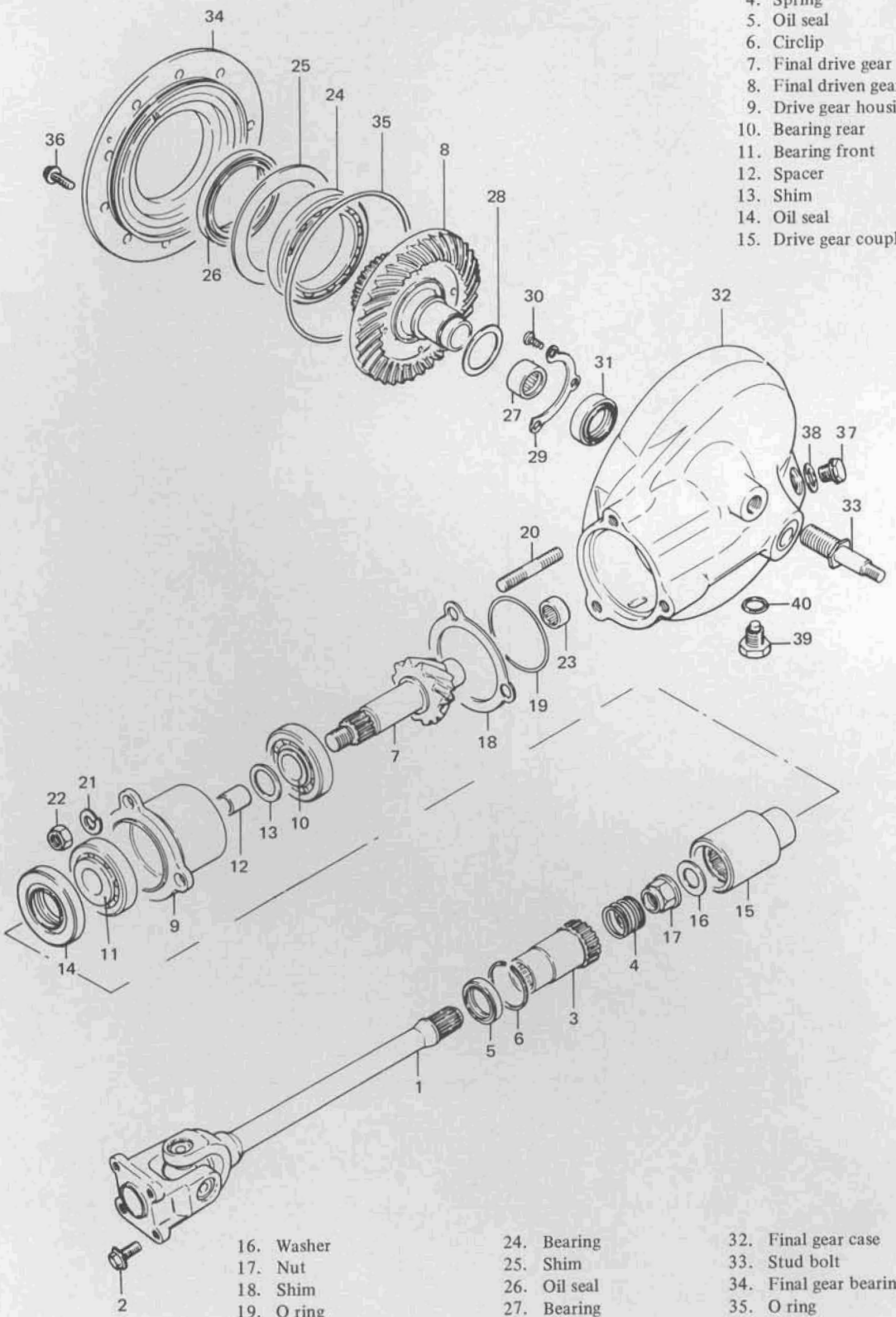

Preload 3.0 – 5.0 kg-cm
(2.60 – 4.35 lb-in.)
Backlash 0.08 – 0.13 mm
(0.003 – 0.005 in.)
Preload 4.0 – 7.0 kg-cm (3.45 – 6.05 lb-in.)
Preload 4.0 – 8.0 kg-cm
(3.4 – 6.9 lb-in.)
Clearance 0.05 – 0.15 mm
(0.002 – 0.006 in.)
Backlash 0.03 – 0.64 mm
(0.001 – 0.025 in)

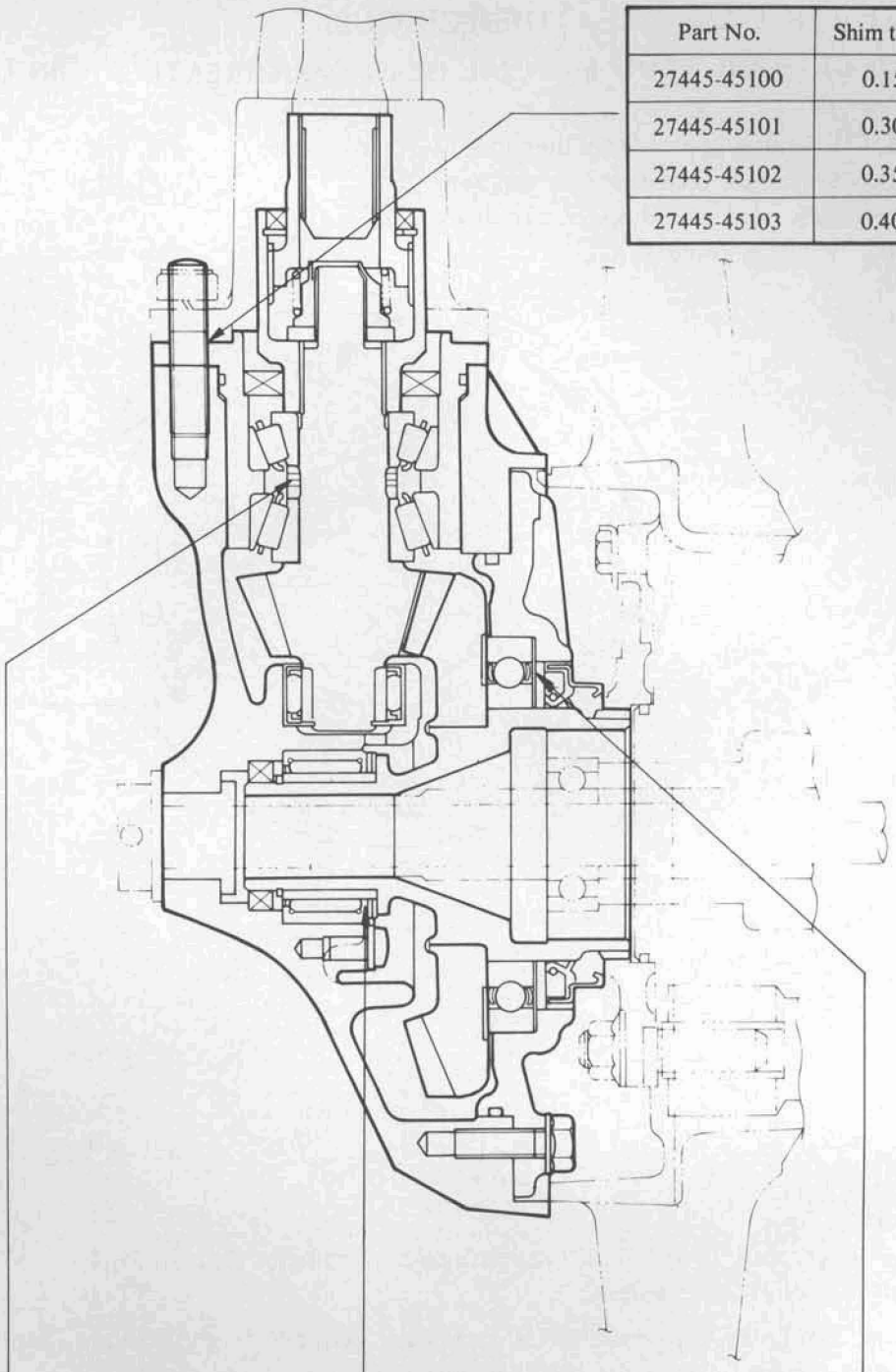
Fig. 8-2

FINAL DRIVE BEVEL GEAR ASSEMBLY



1. Propeller shaft
2. Bolt
3. Propeller shaft coupling
4. Spring
5. Oil seal
6. Circlip
7. Final drive gear
8. Final driven gear
9. Drive gear housing
10. Bearing rear
11. Bearing front
12. Spacer
13. Shim
14. Oil seal
15. Drive gear coupling
16. Washer
17. Nut
18. Shim
19. O ring
20. Stud bolt
21. Washer
22. Nut
23. Needle roller bearing
24. Bearing
25. Shim
26. Oil seal
27. Bearing
28. Shim
29. Bearing holder
30. Screw
31. Oil seal
32. Final gear case
33. Stud bolt
34. Final gear bearing case
35. O ring
36. Bolt
37. Oil filler plug
38. Gasket
39. Oil drain plug
40. Gasket

Fig. 8-3



Part No.	Shim thickness
27445-45100	0.15 mm
27445-45101	0.30 mm
27445-45102	0.35 mm
27445-45103	0.40 mm

Part No.	Shim thickness
09181-25006	1.60 mm
09181-25007	1.62 mm
09181-25008	1.64 mm
09181-25009	1.66 mm
09181-25010	1.68 mm
09181-25011	1.70 mm
09181-25012	1.80 mm
09181-25013	1.90 mm
09181-25014	2.00 mm

Part No.	Shim thickness
27326-45100	1.25 mm
27326-45101	1.20 mm
27326-45102	1.05 mm
27326-45103	1.10 mm
27326-45104	1.35 mm

Part No.	Shim thickness
27327-45100	0.35 mm
27327-45102	0.40 mm
27327-45103	0.50 mm
27327-45104	0.60 mm

Fig. 8-4

FINAL GEAR CASE BREATHER CIRCUIT

AIR AND GEAR OIL FLOW IN FINAL GEAR CASE BREATHER CIRCUIT

Breather circuit

The GS850G final gear case breather circuit (passage) consists of the final gear case and final gear bearing case, and air/oil mixed gas flows through the following routes:

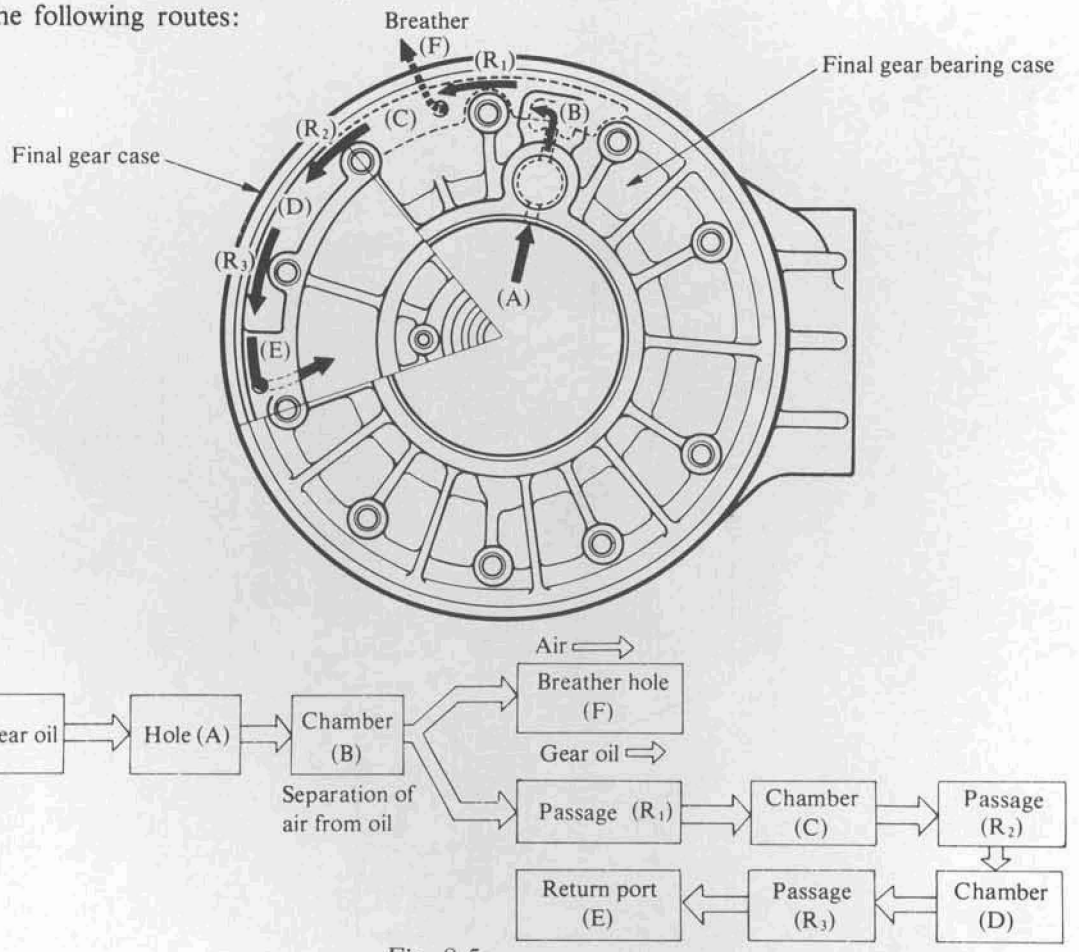


Fig. 8-5

Air passage

When the air pressure in the final gear case becomes higher than atmospheric pressure both air and oil flow in the following passages.

- Air flows from hole (A) to chamber (B) and passes through the gap between rib (R_1) and bearing case to the atmosphere through the breather hole (F).

Oil passage

When the final gear case pressure rises abruptly or when the gear case oil level changes during cornering, the gear oil may sometime flows out into the air passage.

- In this case, the gear oil, which has flown into hole (A), goes into chamber (B), where the oil is separated from the air.
- Then, the air flows through the gap between rib (R_1) and bearing case and goes out through the breather.
- On the other hand, the gear oil, when the gear case pressure is higher than atmospheric pressure, flows through the gaps between ribs, (R_1), (R_2) and (R_3) and bearing case and returns to the gear case from gear oil return port (E).

FINAL DRIVE BEVEL GEAR ASSEMBLY

REMOVAL AND DISASSEMBLY

NOTE:
Be sure to retain all adjusting shims for reassembly.

- Place an oil pan under the final drive bevel gear assembly, remove the drain plug and drain the oil.
- Remove the rear wheel assembly (See page 11-39)
- Remove three nuts attaching the final drive housing to the swing arm, and move the housing to the rear to detach it from the swing arm.
- Remove ten final gear bearing case bolts. (Fig. 8-6)

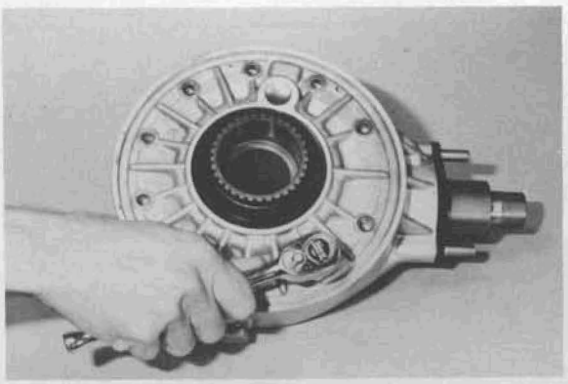


Fig. 8-6

- To remove the final gear bearing cover from the housing, use two 6 mm screws; screw them into the holes provided and draw the cover off evenly. (Fig. 8-7)

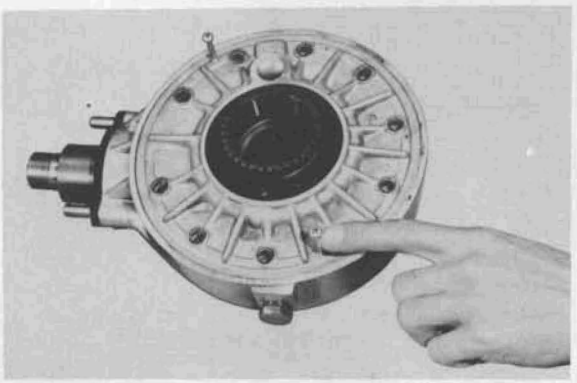


Fig. 8-7

- Using special tools ① and ② , remove the oil seal from the final gear bearing case. (Fig, 8-8)

①	Bearing and oil seal handle	09924-74510
②	Oil seal installer and remover	09924-74520

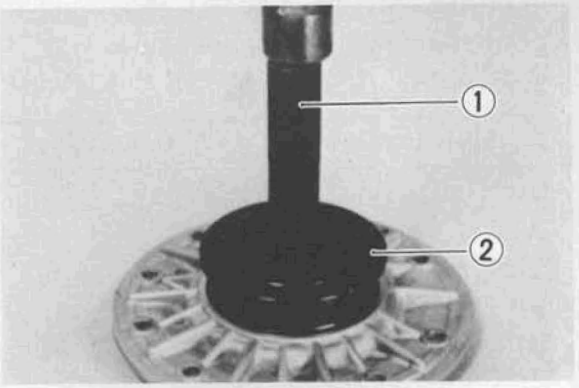


Fig. 8-8

- Using special tool ③ , remove the ball bearing from the driven gear. (Fig. 8-9)

③	Final driven gear bearing installer and remover	09924-74570

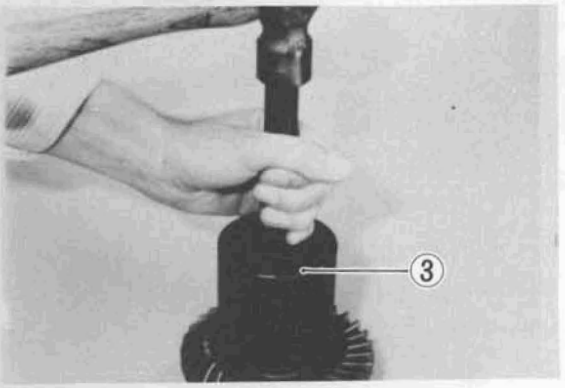


Fig. 8-9

- Remove the three screws and bearing retainer, and shims from the final gear case. (Fig. 8-10)

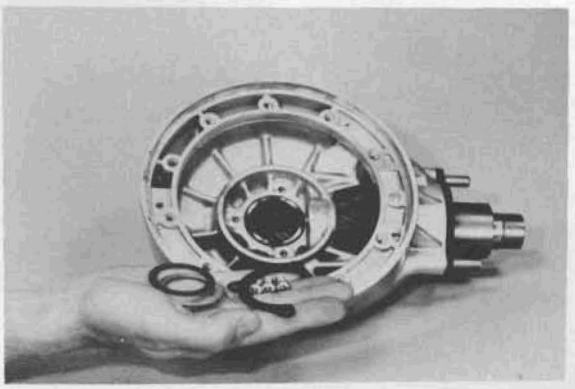


Fig. 8-10

- Remove the final drive gear housing from the final gear case.
- Remove the oil seal ① , circlip ② , propeller shaft coupling ③ , and spring ④ from the final drive gear coupling. (Fig. 8-11)

⑤	Snap ring plier	09900-06108

NOTE:
To remove the circlip ② , it will be necessary to push the propeller shaft coupling inwards, to remove spring pressure from the circlip.

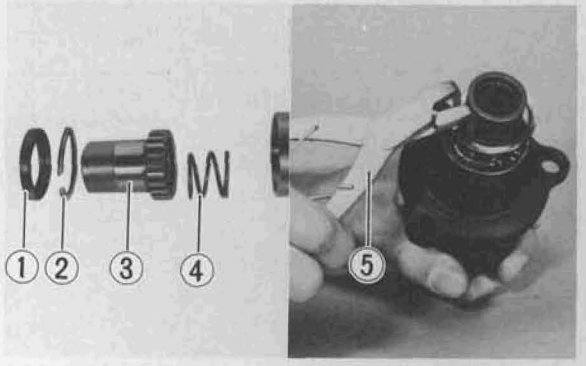


Fig. 8-11

- Straighten the bent portion of the final drive gear nut. Use special tool ① to hold the coupling, and remove the nut. (Fig. 8-12)

①	Final drive gear coupling holder	09924-64510

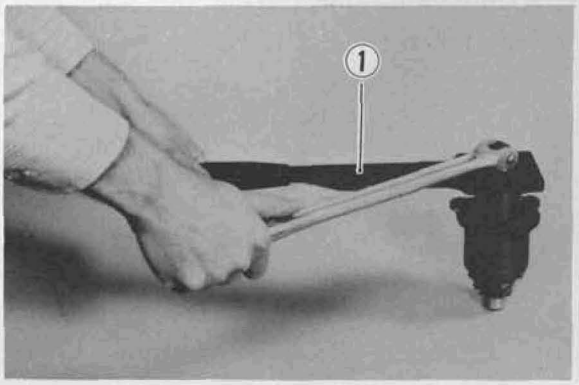


Fig. 8-12

- Remove the washer and coupling, and tap the drive gear shaft with a plastic hammer to remove it from housing. Do not lose the shims and spacer on the final drive gear shaft. (Fig. 8-13)

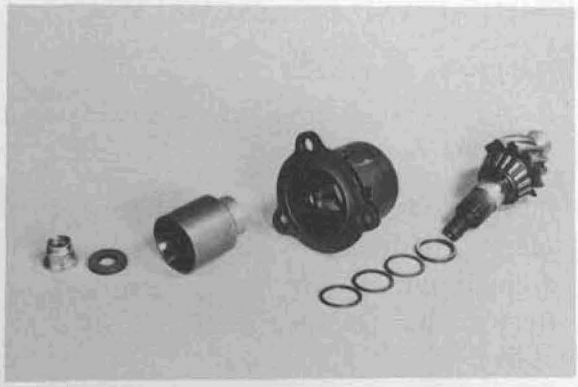


Fig. 8-13

- To remove the inner bearing race from gear shaft, use special tool ② . (Fig. 8-14)

②	Bearing inner race remover	09941-84510

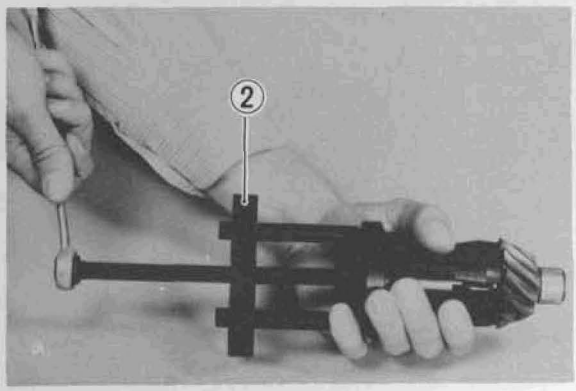


Fig. 8-14

- To remove the oil seal from the housing, use special tools ③ and ④ . (Fig. 8-15)

③	Bearing and oil seal remover	09941-64510
④	Rotor remover shaft set	09930-30102

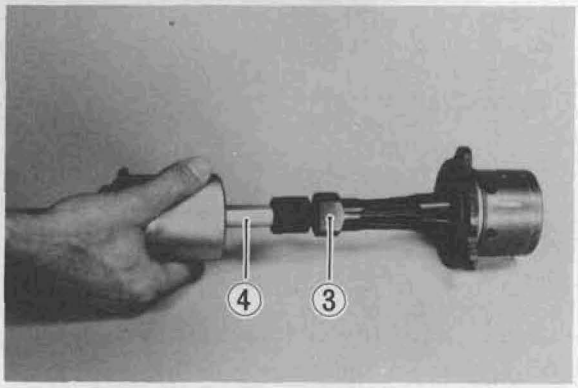


Fig. 8-15

- To remove the outer bearing races from the housing, use special tools ⑤ and ⑥ and a hammer. (Fig. 8-16)

⑤	Bearing Outer Race Remover	09941-54911
⑥	Bearing Installer	09913-84510

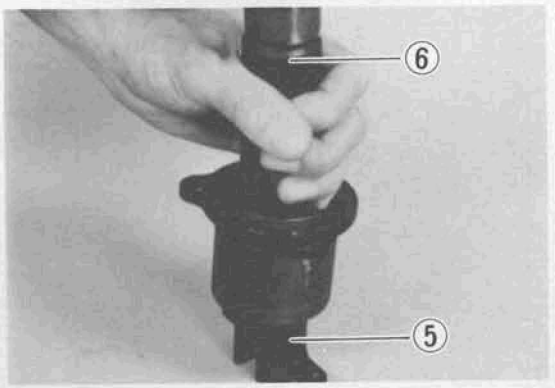


Fig. 8-16

- To remove the two needle roller bearings from the final gear case, use special tools ① and ② . (Fig.8-17, 8-18)

①	Bearing and oil seal remover	09941-64510
②	Rotor remover shaft set	09930-30102

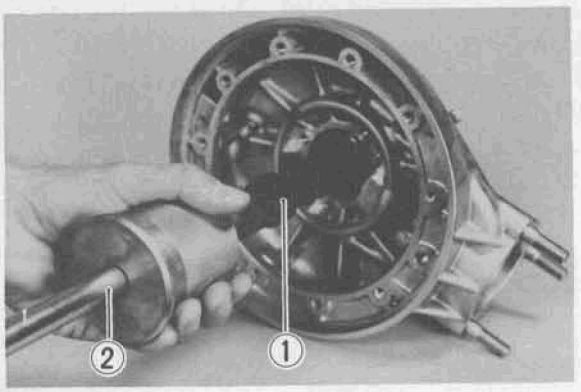


Fig. 8-17

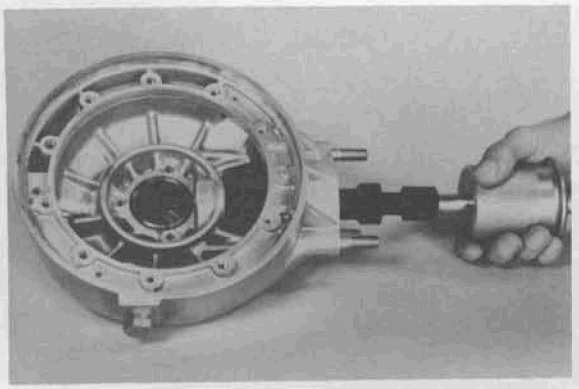


Fig. 8-18

- To remove the final gear case oil seal, use special tools ① and ② . (Fig. 8-19)

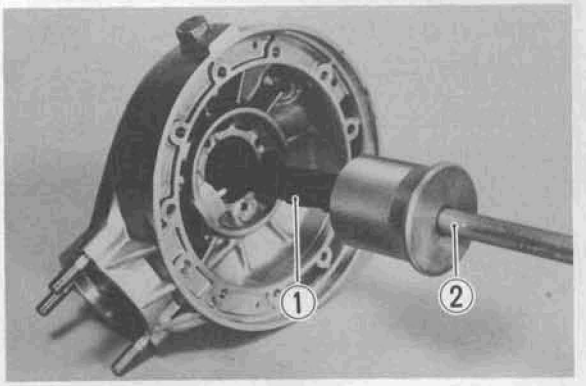


Fig. 8-19

- If replacing the final gear case, remove the three drive housing studs, and shock absorber mounting stud.

INSPECTION AND REASSEMBLY

NOTE:
Before reassembly, thoroughly clean all parts in cleaning solvent.

NOTE:
It will be helpful to have a selection of all shims available for clearancing operations.

- To install the outer bearing races into the drive gear housing, use special tool ① . (Fig. 8-20)

①	Bearing installer set	09924-84510

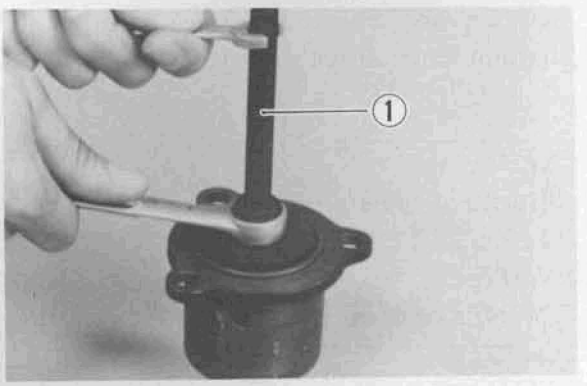


Fig. 8-20

- To install the inner bearing race onto the final drive gear shaft, use special tool ② . (Fig. 8-21)

CAUTION:
When replacing the final drive gear, replace the driven gear also, as they must be replaced together.

②	Bearing Installer	09913-84510

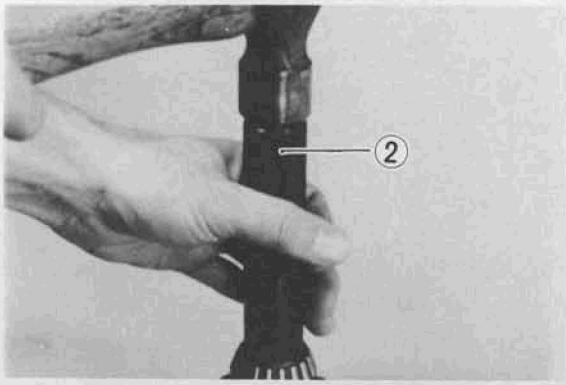


Fig. 8-21

- Install the spacer and shims removed from the old final drive gear on the new gear. Install gear into housing (Fig. 8-22)

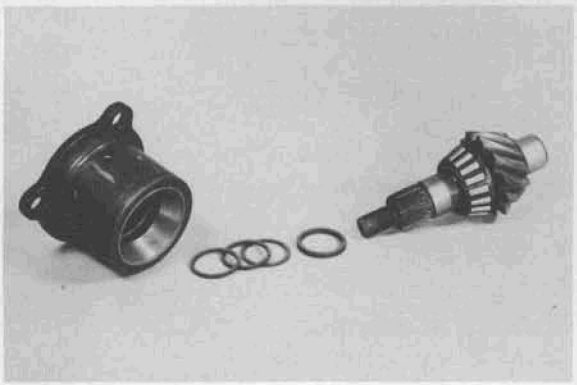


Fig. 8-22

- Install the other inner bearing race, the washer and final drive gear nut, and tighten to specification, using special tool ① . (Fig.8-23)

NOTE:
Always use a new nut.

NOTE:
Coat the bearings with Hypoid gear oil.

NOTE:
No oil seal is installed at this point. Oil seal is installed after bearing preload is correct.

Nut tightening torque		9.0—11.0 kg-m (65.0—79.5 lb-ft)

①	Final drive gear coupling holder	09924-64510

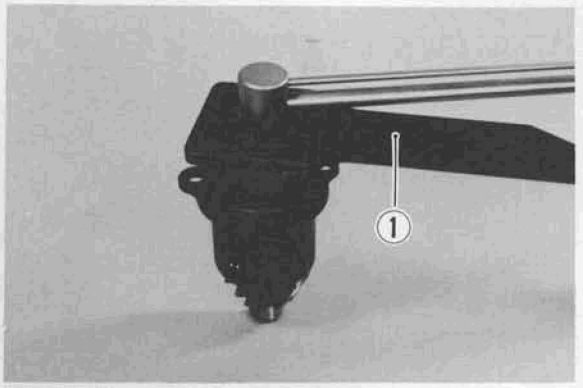


Fig. 8-23

FINAL DRIVE GEAR PRELOAD ADJUSTMENT

- After tightening the final drive gear nut to specification, measure the bearing preload using special tool ① with a ½″ × ¼″ adapter Socket. (Fig. 8-24)

NOTE:
Rotate the gear several turns in both directions to seat the bearings.

Preload torque		4.0—8.0 kg-cm (3.4—6.9 lb-in)

①	Torque wrench	09900-21107

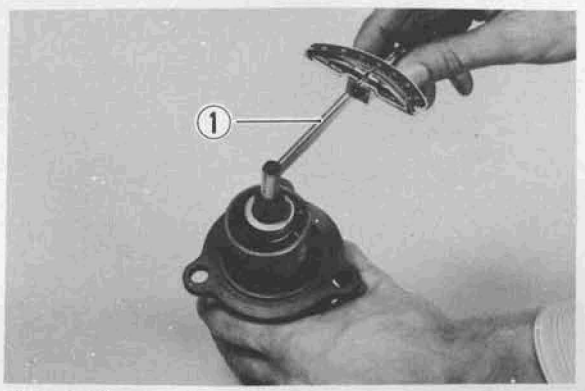


Fig. 8-24

- If the preload measured is not correct. (4.0-8.0 kg-cm) remove the final drive gear and change the shims according to the following chart:

Preload	Shim
Under 4 kg-cm	Decrease shim thickness
4.0—8.0 kg-cm (3.4—6.9 lb-in)	Correct
Over 8 kg-cm	Increase shim thickness

- Re-torque the final drive gear nut to specification, and re-check the preload measurement until it is correct.

List of Shims

Part No.	Shim thickness
09181-25006	1.60 mm
09181-25007	1.62 mm
09181-25008	1.64 mm
09181-25009	1.66 mm
09181-25010	1.68 mm
09181-25011	1.70 mm
09181-25012	1.80 mm
09181-25013	1.90 mm
09181-25014	2.00 mm

- Once the bearing preload is correct, remove the nut, washer and coupling, and remove the final drive gear from the housing. Using special tools ③ and ④ , install a new oil seal into the housing. (Fig. 8-25)

③	Bearing and oil seal handle	09924-74510
④	Final drive bevel gear housing oil seal installer	09924-74560

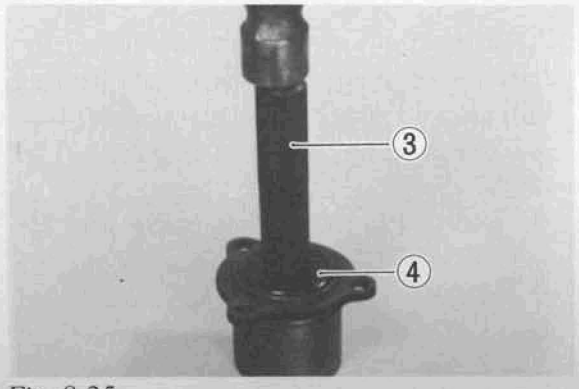


Fig. 8-25

- Liberally coat the bearings with Hypoid gear oil and reinstall the final drive gear into the housing.
- Make sure the final drive gear threads are free of oil. Put a small amount of SUZUKI THREAD LOCK SUPER "1333B" on the threads, install the drive gear coupling, washer and nut, and torque to specification. (Fig. 8-26)

Thread Lock Super "1333B"		99000-32020
①	Final drive gear coupling holder	09924-64510
Nut tightening torque		9.0—11.0 kg-m (65.0—79.5 ft-lbs)

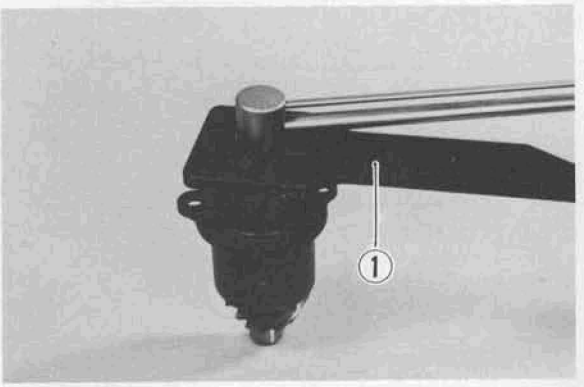


Fig. 8-26

- After tightening the nut to specification, bend the collar of the nut over into the notch in the final drive gear shaft.

FINAL DRIVEN GEAR ASSEMBLY

- To install the final gear case oil seal, use special tools ① and ② . (Fig. 8-27)

①	Oil Seal Installer	09924-74550
②	Handle	09924-74510

NOTE:
The seal is correctly installed when the lip spring is on the driven gear side.

NOTE:
Always use a new seal.

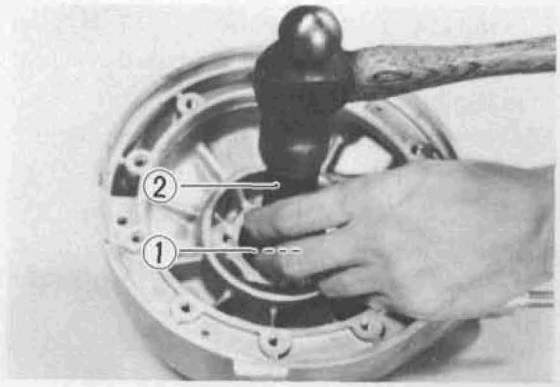


Fig. 8-27

- Use special tools ③ and ④ to install the needle bearing for the driven gear. (Fig. 8-28)

CAUTION:
The bearing case has a stamped mark on one end, which must face inside.

③	Bearing Installer	09913-84510
④	Final Gear Case Bearing Installer	09924-94510

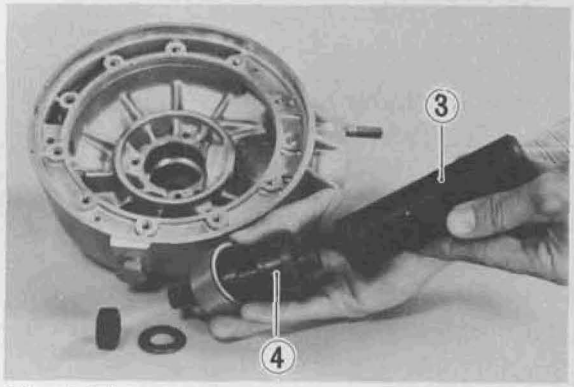


Fig. 8-28

- Install the needle roller bearing for the final drive gear into the final gear case using special tools ① , ② and ③ . (Fig. 8-29)

①	Bearing & oil seal installer handle	09924-74510
②	Bearing installer	09924-74530
③	Pilot	09924-74540

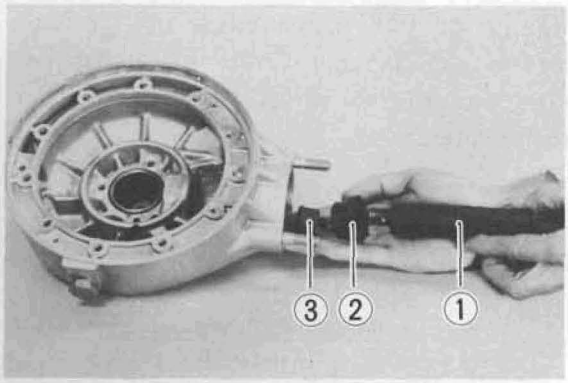


Fig. 8-29

- Install the driven gear needle bearing retainer plate. Use SUZUKI THREAD LOCK " 1342 " on the screws, and tighten to specification.

Thread Lock "1342"	99000-32050

Screw tightening torque	0.8—1.0 kg-m (6.0—7.5 lb-ft)

- Install the ball bearing onto the final driven gear, using special tool ① . (Fig. 8-30)

①	Final driven gear bearing installer	09924-74570

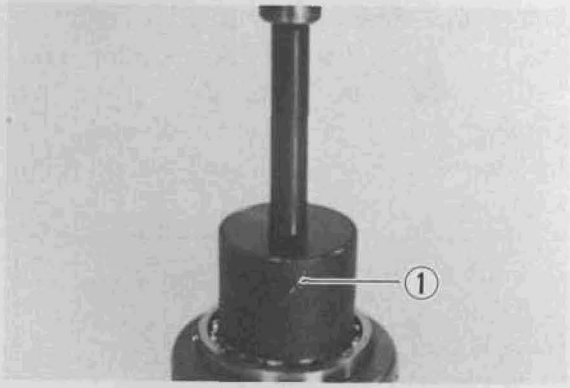


Fig. 8-30

- Place the final driven gear shims on the driven gear needle bearing, oil the bearing with Hypoid gear oil, and install the driven gear complete into the final gear case. (Fig. 8-31)
- Place two 10mm nuts on each stud (to prevent the nuts from bottoming on the unthreaded portion of the studs) and tighten the nuts to the following torque.

Tightening Torque	2.0—3.0 kg-m (14.5—21.5 lb-ft)

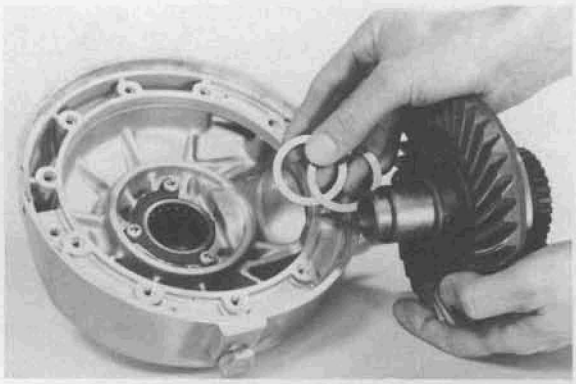


Fig. 8-31

- Oil the final driven gear ball bearing with Hypoid gear oil, place the shims removed during disassembly on the bearing, and install the final driven gear bearing cover, without oil seal. Install the ten bolts and tighten to specification.

Final Gear Bearing Cover Bolt Torque	2.0–2.6 kg-m (14.5–19.0 lb-ft)

FINAL GEAR BEARING COVER SHIM ADJUSTMENT

- Using a thickness gauge, measure the clearance between the shims and the bearing cover. If not within specification, the shims must be changed. (Fig. 8-32)

Final gear bearing cover shim clearance	0.05 – 0.15 mm (0.002 – 0.006 in)

List of Shims

Part Number	Thickness
27327-45100	0.35 mm
-45102	0.40
-45103	0.50
-45104	0.60

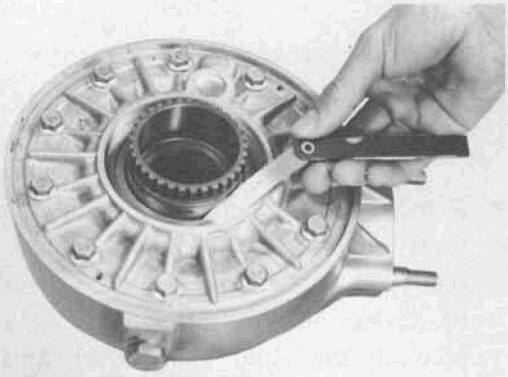


Fig. 8-32

BACKLASH MEASUREMENT

- Using the shims removed during disassembly, install the final drive gear housing, without o-ring, into the final gear case and remove the final gear bearing case oil seal. Tighten the nuts and bolts to specification.

Final Drive Gear Housing Nut Torque	3.5–4.5 kg-m (25.5–32.5 lb-ft)
Final Gear Bearing Case Bolt	2.0–2.6 kg-m (14.5–19.0 lb-ft)

- Install the backlash measuring tool on the drive gear coupling, and set-up a dial gauge as shown in Fig. 8-33).

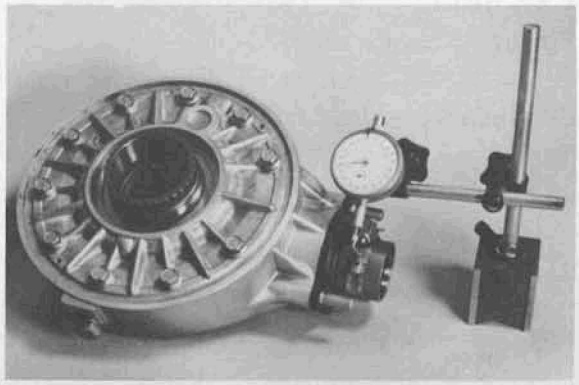


Fig. 8-33

Backlash Measuring Tool	09924-34510

- Adjust the dial gauge so that it touches the backlash measuring tool arm at the mark; hold the final driven gear securely, and turn the final drive gear coupling slightly in each direction, reading the total backlash on the dial gauge.

Final Gear Backlash	0.03 – 0.64 mm (0.001 – 0.025 in)

NOTE:
If the backlash is not within specification, adjust the shim thickness as follows:

- Remove shims from final gear cover and final gear case, and measure total thickness.
- In order not to change the clearance between the final gear cover and final driven gear bearing, the total thickness of the shims installed after a change is made must equal the original total thickness of shims.
- If backlash is too large:
  a) install a thinner shim pack between final driven gear and final gear case.
  b) Increase thickness of shims between final gear cover and bearing by an amount equal to the decrease above.
- If backlash is too small:
  a) Install a thicker shim pack between final driven gear and final gear case.
  b) Decrease thickness of shims between final gear cover and bearing by an amount equal to the increase above.

EXAMPLE:

Final gear to case shims;
1.35mm + 1.05mm = 2.40mm
Final gear cover to bearing shims;
0.50mm + 0.40mm = 0.90mm
Original total measurement = 3.30mm

Backlash too large:

Final gear to case shims;
1.30mm + 1.05mm = 2.35mm
Final gear cover to bearing shims;
0.60mm + 0.35mm = 0.95mm
3.30mm

Backlash too small:

Final gear to case shims;
1.40mm + 1.05mm = 2.45mm
Final gear cover to bearing shims;
0.50mm + 0.35mm = 0.85mm
3.30mm

List of Shims - Final Gear to Case

Part Number	Thickness
27326-45104	1.35 mm
-45100	1.25
-45101	1.20
-45103	1.10
-45102	1.05

List of Shims - Final Gear Cover to Bearing

Part Number	Thickness
27327-45100	0.35 mm
-45102	0.40
-45103	0.50
-45104	0.60

TOOTH CONTACT ADJUSTMENT

- After backlash adjustment is carried out, the tooth contact must be checked.
- Remove the 10 bolts from the final gear cover, and remove the cover, using the screws from the contact breaker cover (see page 8 - 7). Do not misplace the shims. Remove the driven gear.
- Clean and de-grease several teeth on the final driven gear. Coat these teeth with machinist's dye (usually available from parts houses) or paste, preferably of a light color.
- Re-install the driven gear with shims in place, positioning the coated teeth so they are centered on the final drive gear.
- Re-install the final gear cover and bolts, and tighten to specification.

Final Gear Cover Bolt Tightening Torque	2.0–2.6 kg-m (14.5–19.0 lb-ft)

- Using a socket and handle on the final drive gear coupling nut, rotate the final drive gear several turns in each direction, while loading the final driven gear. This will provide a contact pattern on the coated teeth of the driven gear.
- Remove the final gear cover and final gear, and inspect the coated teeth of the driven gear. The contact patch should be as shown below:

- If the tooth contact pattern is correct, as shown in (A), go to the Final Assembly section.
- If the tooth contact pattern is incorrect, as shown in (B), a thinner shim is needed between the final drive gear housing and final gear case.
- If the tooth contact pattern is incorrect, as shown in (C), a thicker shim is needed between the final drive gear housing and final gear case.
- If the tooth contact pattern is incorrect for either reason, the appropriate shim must be installed, and the tooth contact pattern re-checked by repeating the tooth coating procedure above.

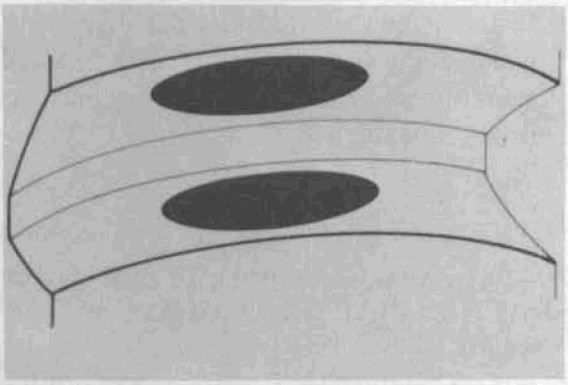


Fig. 8-34 (A)

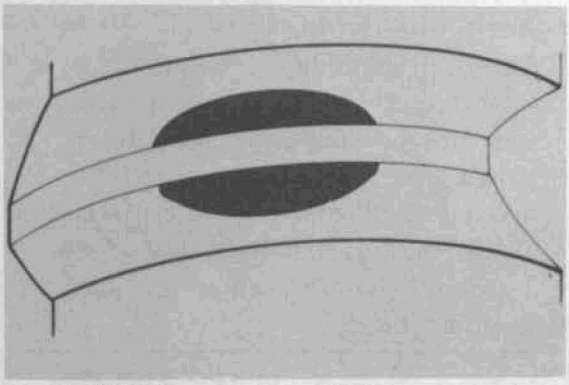


Fig. 8-35 (B)

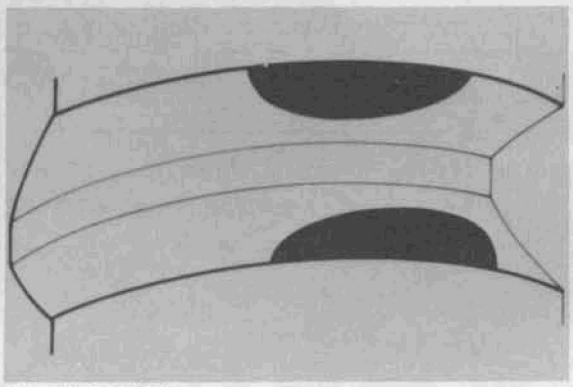


Fig. 8-36 (C)

NOTE:
If it is necessary to adjust the shim thickness between final drive gear housing and final gear case, the final gear backlash may change, and should be re-checked according to the procedure outlined under the Backlash Measurement sub-section. Both adjustments may need to be changed until both backlash and tooth contact are correct.

List of Shims - final Drive Gear Housing to Final Gear Case

Part No.	Shim thickness
27445-45100	0.15 mm
27445-45101	0.30 mm
27445-45102	0.35 mm
27445-45103	0.40 mm

FINAL ASSEMBLY

- After adjusting the backlash tooth contact and clearance between the bearing cover and the bearing, remove the final gear cover, clean the mating surfaces thoroughly, and apply SUZUKI BOND No. 1207B to the area indicated below. (Fig. 8-37)

CAUTION:
Thoroughly clean mating surfaces of final gear case and bearing case.
Take care not to apply SUZUKI BOND NO. 1207B to ribs Ⓐ or not allow it to flow on to ribs.

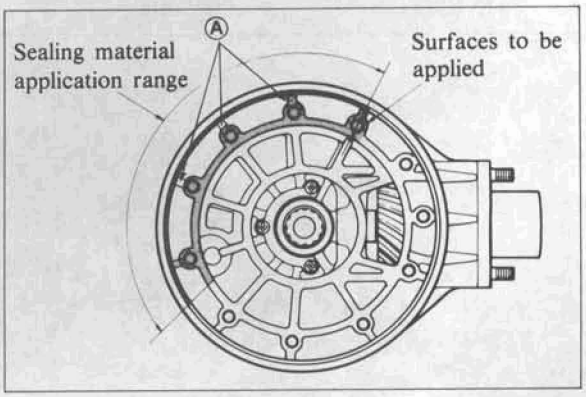


Fig. 8-37

- Use special tools ① and ② to install a new oil seal into the final gear bearing cover. (Fig. 8-38)

NOTE:
Lip of seal with spring goes toward final driven gear.

①	Bearing & Oil Seal Installer Handle	09924-74510
②	Oil Seal Installer and remover	09924-74520

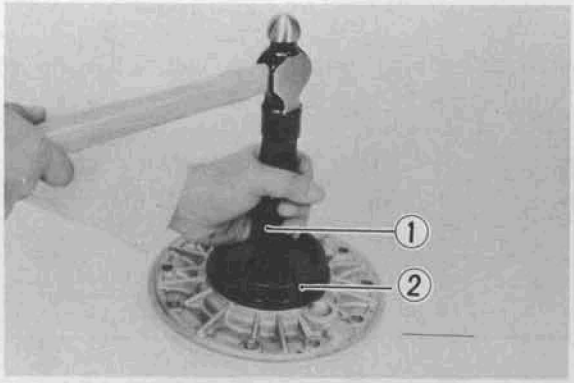


Fig. 8-38

- Install the final gear bearing cover and tighten the 10 bolts to specification. Take care not to damage the seal lip.

Tightening Torque	2.0–2.6 kg-m (14.5–19.0 lb-ft)

- Remove the final drive gear housing from the final gear case.
- Liberally coat the final drive gear coupling splines with Lithium Base Molybdenum Grease (NLGI #2), and install the propeller shaft coupling spring and propeller shaft coupling.
- Push the coupling in against the spring and install the circlip. (Fig. 8-39)

Snap Ring Pliers	09900-06108

Fig. 8-39

- Using special tool ③ , install a new oil seal into the propeller shaft coupling.

Bearing Installer	09913-84510

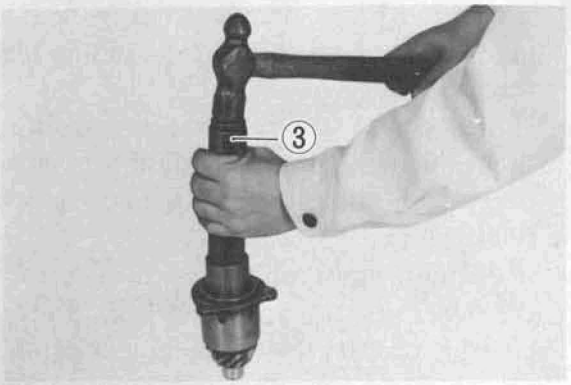


Fig. 8-40

- Install a new o-ring on final drive gear housing, lubricate it lightly with Hypoid gear oil, and install the housing into the final gear case.

INSTALLATION OF PROPELLER SHAFT & FINAL DRIVE GEAR ASSEMBLY

- For installation, reverse the procedure for removal.
- Apply SUZUKI BOND NO.1207B (99104-31140) to the end of the swing arm.
- Coat propeller shaft splines with Lithium Base Molybdenum Grease (NLGI #2).
- Install the final driven gear assembly, making sure the propeller shaft splines are aligned into the coupling.
- Torque the attachment nuts to specifications.

Tightening torque	3.5 – 4.5 kg-m (25.5 – 32.5 lb-ft)

- Tighten the final gear case drain plug.

Tightening torque	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft)

- Add Hypoid gear oil through filler hole until level is equal to filler hole opening level.

FUEL SYSTEM & CARBURETORS

CONTENTS

FUEL COCK 9- 2
FUEL TANK 9- 2
CARBURETORS 9- 3
STARTER UNIT 9- 3
TROUBLE SHOOTING 9-12

FUEL SYSTEM & CARBURETORS

FUEL COCK

The construction of the diaphragm type auto cock is shown below. When the engine is not running with the lever in the ON or RES position, the valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is started, a negative pressure is generated in the diaphragm chamber through the vacuum (negative pressure) pipe which is connected to the carburetors, and builds up a negative pressure which is higher than the spring pressure so that the diaphragm is forced to open the valve and thus allow the fuel to flow to the carburetors. When the lever is set at the PRI (which stands for priming to supply the fuel to the carburetors of an internal combustion engines) position, the fuel flows to the carburetors not via the diaphragm unit but directly through the RES (reserve) pipe.

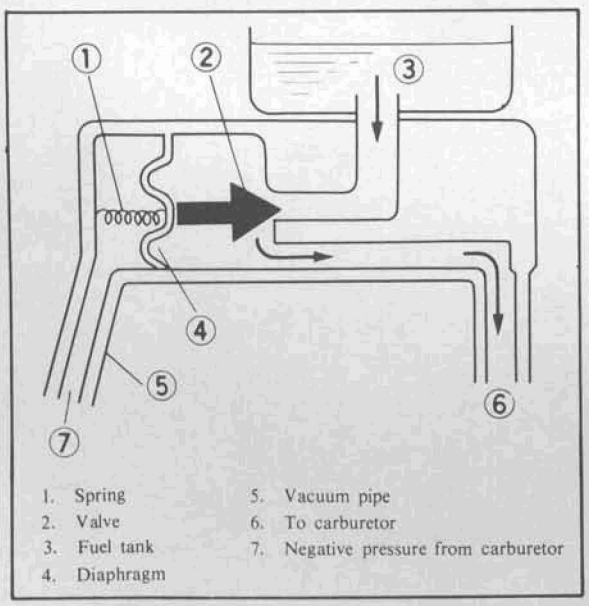


Fig. 9-1

ON: Normally used. Functions as auto cock.

RES: Reserve fuel is used. Functions as auto cock.

PRI: Fuel is directly supplied. Does not function as auto cock.

The PRI position is used when the carburetors have little or no fuel, for example, when filling the fuel tank for the first time, or when the motorcycle has been left unused for a long time, or when the carburetors have been disassembled and repaired. Shift the lever to the ON position when the engine begins to run smoothly.

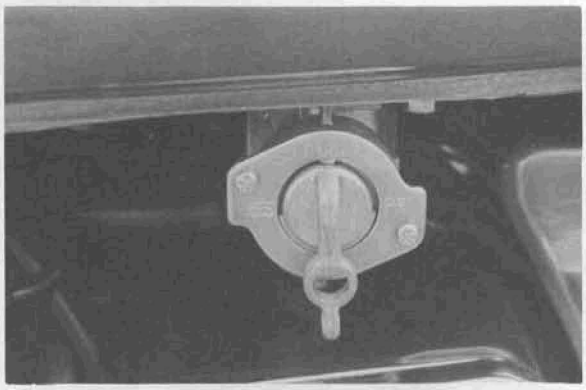


Fig. 9-2

Cleaning

The fuel cock filter will collect impurities, and therefore must be periodically checked and cleaned.

FUEL TANK

The fuel tank has a cap with an air vent which is necessary for the smooth flow of the fuel to the carburetors. The fuel will not flow if the air vent is clogged. If this occurs, clean the air vent with compressed air.

Install the tank filler cap with the arrow mark facing toward the front.

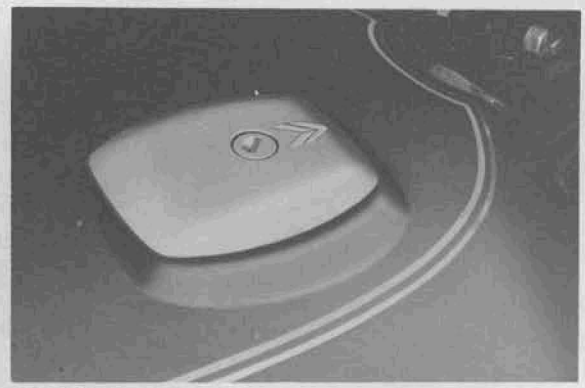


Fig. 9-3

Cleaning

Clean the fuel tank with flushing oil at the same time the fuel cock filter is being cleaned.

CARBURETORS

IMPORTANT:
The GS850G carburetors have been manufactured and adjusted to special precise tolerances to meet the EPA emission levels. Before attempting to service or repair the carburetor assemblies, thoroughly read and understand the following instructions contained in this chapter, and also carefully review the information contained in the emission control systems and regulations chapter. It contains very important and specific information on the carburetor components.

DO NOT ADJUST THE AIR SCREW AND PILOT SCREW. Both of these components are pre-set at the factory using very specialized equipment. They can not be reset to the exact setting determined by the factory. Refer to the emission control systems and regulation chapter for further information.

Description

This motorcycle has four carburetors, each of which must be so adjusted properly to assure engine performance.

The link arm is moved by the two throttle cables that are connected to the throttle grip to open or close all carburetor throttle valves at the same time.

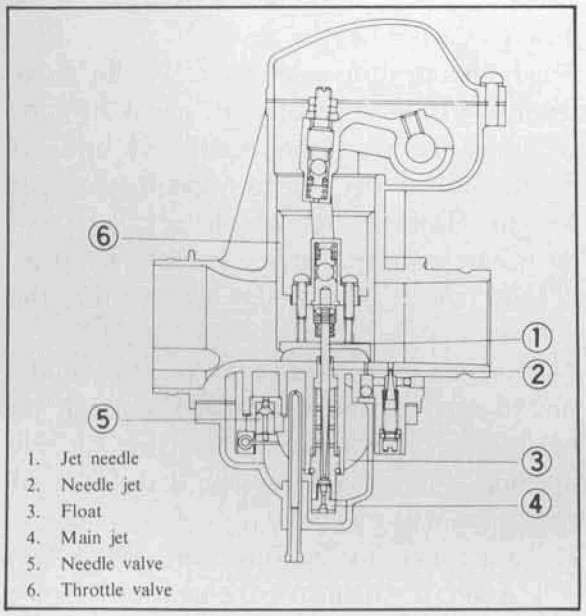


Fig. 9-4

Each carburetor has four units for regulating and supplying fuel. There is the starter unit for supplying a rich fuel-air mixture when starting the engine, a pilot unit for supplying fuel when the engine is idling, a main unit for supplying fuel when the engine is running at medium-or high-speed, and a float unit for maintaining a constant carburetor fuel level. The carburetors mix gasoline with air, and regulate the mixture. Carburetor malfunctioning or trouble generally occurs due to a bad mixing ratio, which is the result of wearing, blocking by foreign matter, or an improper fuel level. The following are some of the symptoms of a faulty carburetor.

Fuel-air mixture too lean

1. The engine becomes overheated.
2. The engine runs well when the starter is opened further.
3. Poor acceleration.
4. The spark plugs become overheated.
5. Engine speed is irregular
6. Exhaust gas is light.

Fuel-air mixture too rich

1. The engine is sluggish, and does not run smoothly.
2. The engine runs badly when the starter is opened further.
3. The engine runs badly after being warmed up.
4. The engine runs well when the air filter is removed.
5. The spark plugs get soiled with carbon.
6. Exhaust gas is blackish in color.

STARTER UNIT

The starter unit is a starting aid device which supplies a highly concentrated fuel-air mixture to a cold engine at initial starting. It consists of a starter jet ①, starter pipe ②, and starter plunger ③. Refer to Fig. 9-5. To activate the starter unit close the throttle valve, open the starter plungers fully by pulling out choke knob, and activate the starter or kick. Then the engine will generate negative pressure to draw the fuel through the fuel injection ports.

The fuel is metered by the starter jet, is mixed with the air coming from the float chamber in the starter pipe, sucked into the starter

plunger chamber, where it is mixed with the starter's primary air, and then drawn out into the main bores from the injection ports as a well-atomized and concentrated fuel very suitable for starting purposes. This fuel-air mixture is added to the fuel-air mixture being supplied by the pilot circuit in the carburetors.

When using the starter, the throttle valve must be completely closed. If the throttle valve is opened, the negative pressure falls and will not build up at injection ports and the engine will not be able to draw sufficient fuel. The starter plunger has a needle-like tip, which closes the starter unit's fuel passage. If the starter knob is not pulled all the way up, the fuel passage will not open to let the gasoline flow. If the starter pipe's bleed hole is clogged, the fuel will not be atomized properly.

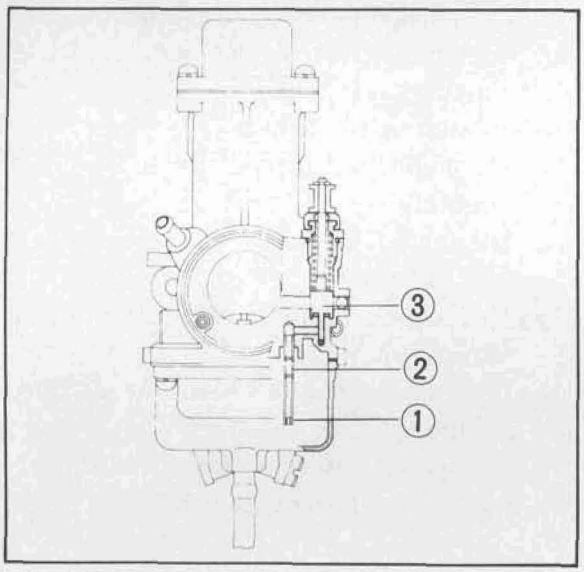


Fig. 9-5

PILOT CIRCUIT

The pilot circuit consists of a pilot air screw ① , pilot jet ② , pilot screw ③ , and pilot outlet ④ . Refer to Fig. 9-6.

The purpose of the pilot circuit is to supply the fuel to the engine until it reaches low idling speed. The passage around the needle jet which serves as the main unit's fuel injection port is wide and little gasoline can be drawn out through the needle jet. The passage is narrower near the pilot outlet and this is where the negative pressure builds up.

This negative pressure allows a highly concentrated gas mixture to be drawn up from the pilot outlet. The metered fuel and air are mixed together prior going to the pilot fuel-air outlets.

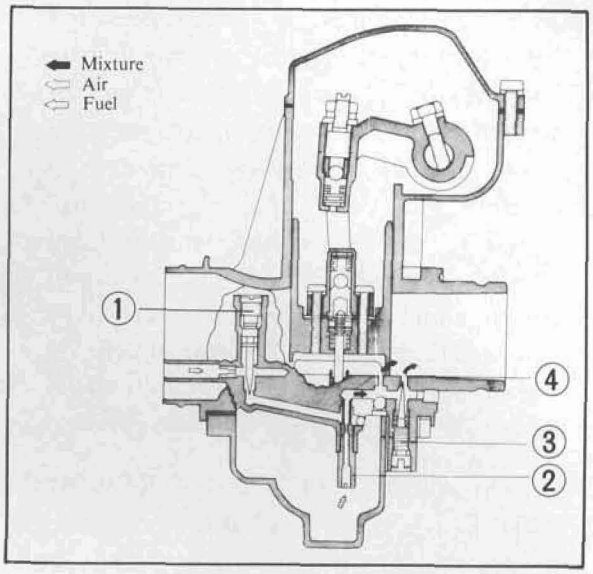


Fig. 9-6

MAIN CIRCUIT

The main circuit consists of the main jet ① , bleed pipe ② , jet needle ③ , needle jet ④ , throttle valve ⑤ , and air jet ⑥ . Refer to Fig. 9-7. It starts operation when the throttle opening is about 1/4.

Gasoline flows from the float chamber through the main jet, and it is metered by the air jet. The gasoline is then mixed with air that is regulated by the air jet. This mixing occures in the bleed pipe after which the mixture glows into the carburetor bore through the needle jet.

When the throttle opening is in the range from 1/4 to 3/4, gasoline is metered by the clearance between the needle jet and jet needle. When the throttle opening exceeds 3/4, the clearance between the needle jet and jet needle becomes larger than the main jet hole and therefore, gasoline is metered by the main jet.

The throttle valve has a cutaway on its intake side to decrease the suction on the needle jet by means of vacuum when the throttle opening is about 1/4, and thus the flow of gasoline can be regulated.

If the main circuit malfunctions, power loss will result in high speed operation. If the

main jet clogs up, the fuel-air mixture becomes lean. On the contrary, if the air jet or bleeder pipe's bleeder hole clogs up, the mixture will become rich. A worn needle jet or jet needle, or a loose main jet, bleeder pipe, or needle jet will also cause a rich mixture.

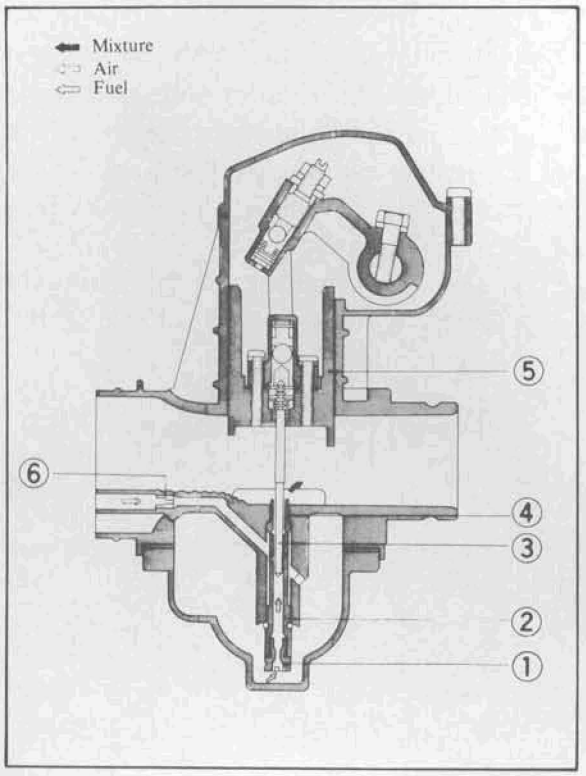


Fig. 9-7

FLOAT UNIT

The float unit consists of a float ① and needle valve ② , etc. Refer to Fig. 9-8. The float unit regulates the fuel level in the carburetors to ensure uniform fuel mixing. If the fuel level is too low, it is difficult to draw the gasoline and the mixed gas will become lean. On the other hand, if the fuel level is too high, it is too easy to draw the gas and the mixed gas will be rich.

Fuel level means the distance from the center of the carburetor's main bore to the surface of the gasoline in the float chamber. It is kept regulated by the opening or closing of the float. valve. When the gasoline flows in through the float valve, the fuel level of the float chamber rises and the float goes up at the same time to push the needle up.

When the gasoline reaches the required level, the needle contacts close to the seat completely stopping the flow of gasoline. When fuel level falls as the gasoline is consumed, the float and needle will fall to allow gasoline to flow in.

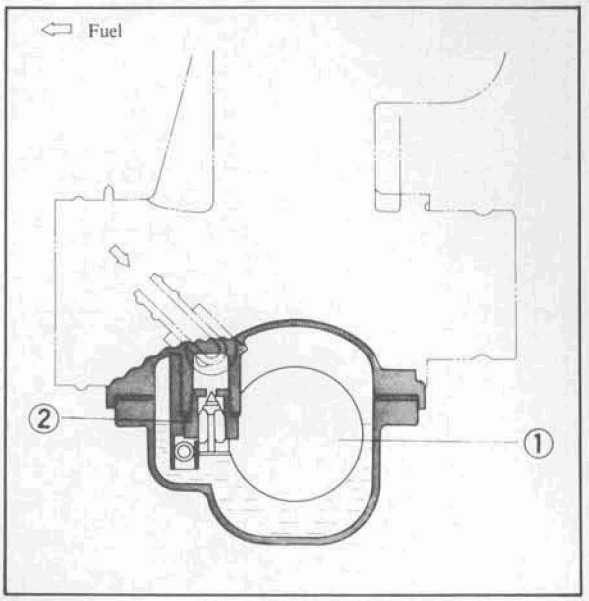


Fig. 9-8

NEEDLE VALVE

If foreign matter is caught between the valve seat and the needle, the gasoline will continue flowing and overflow. If the seat and needle are worn beyond the permissible limits, similar troubles will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber.

To service and inspect, remove the carburetors, float chambers and floats, and clean the float chambers and float parts with gasoline. If the needle is worn as shown below, replace it together with a valve seat. Clean the fuel passage of the mixing chamber with compressed air.

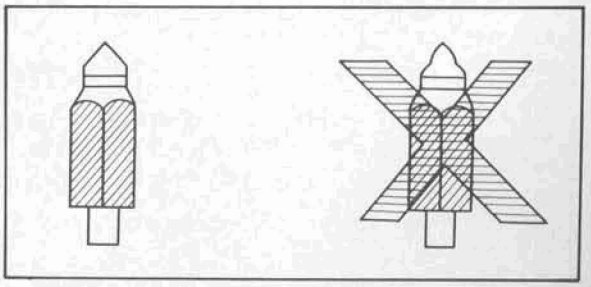
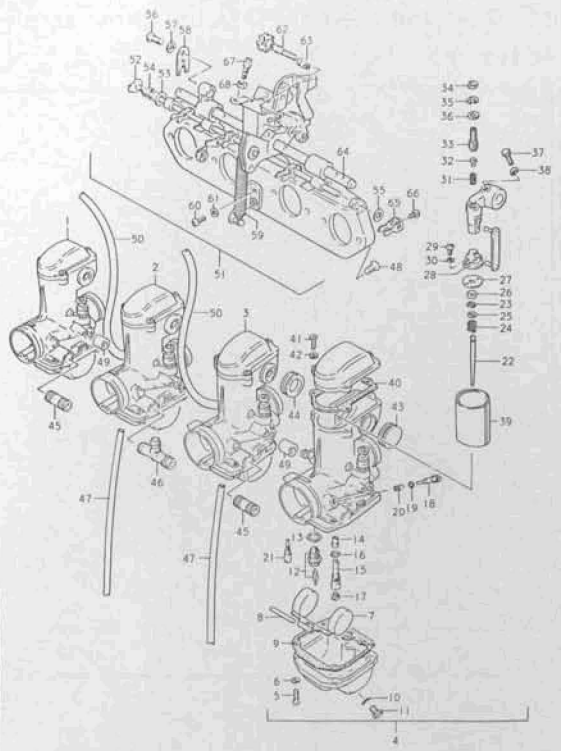


Fig. 9-9



1. Carburetor assy, No. 1
2. Carburetor assy, No. 2
3. Carburetor assy, No. 3
4. Carburetor assy, No. 4
5. Screw
6. Lock washer
7. Float
8. Float pin
9. Gasket
10. O ring
11. Screw
12. Needle valve
13. Gasket
14. Needle jet
15. Breather pipe
16. O ring
17. Main jet
18. Adjuster
19. O ring
20. Spring
21. Pilot jet
22. Needle jet
23. Needle clip
24. Spring
25. Plate
26. Ring
27. Plate
28. Bracket
29. Screw
30. Lock washer
31. Spring
32. Pin
33. Adjuster
34. Nut
35. Lock washer
36. Washer
37. Bolt
38. Lock washer
39. Throttle valve
40. Gasket
41. Screw
42. Lock washer
43. Cap
44. Seal
45. Nipple
46. Nipple
47. Hose
48. Screw
49. Hose
50. Hose
51. Control ass'y
52. Starter shaft
53. Washer
54. Spring
55. Washer
56. Screw
57. Lock washer
58. Plate
59. Throttle return spring
60. Screw
61. Lock washer
62. Throttle stop adjuster
63. Throttle return spring
64. Throttle shaft
65. Choke lever
66. Screw
67. Adjuster
68. Nut

Fig. 9-10

Disassembly

- Shift the fuel cock lever to the ON or RES position.
- Disconnect the fuel pipe and negative pressure pipe from the fuel cock.
- Open the seat, remove the fuel tank mounting bolt, and remove the fuel tank from the frame.
- Remove the air cleaner body. (See page7-6).
- Disconnect the throttle cables and starter cable from the carburetors. (See page 7-6).
- Remove the carburetors. (See page 7-6).
- Remove the carburetor top covers from each carburetor.
- At the center portion of the carburetor assembly, unhook the throttle return spring from the pin.

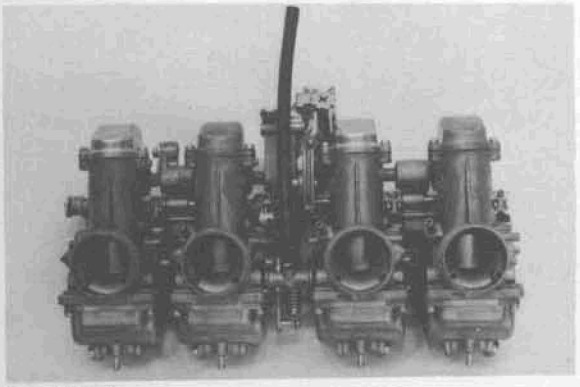


Fig. 9-11

- Remove the five bolts to free the throttle shaft.

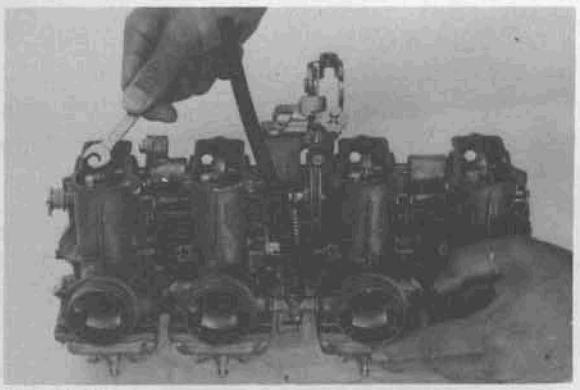


Fig. 9-12

- Remove the stopper plate and pull out the shaft.

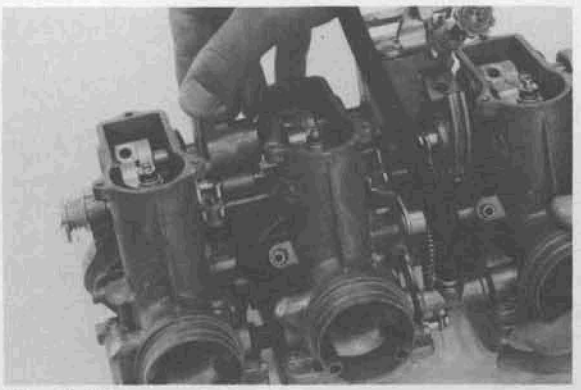


Fig. 9-13

- Loosen the four cross head screws and also the screw in the slot. Draw out the choke shaft.

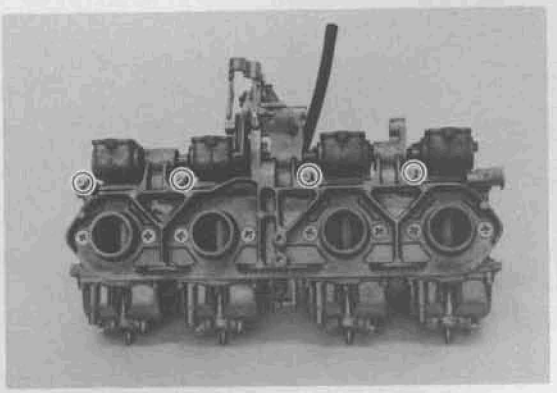


Fig. 9-14

- Remove the plate. A total of 8 screws must be removed to free this plate for removel.

The foregoing procedure permits each carburetor assemblies to be disassembled further in the usual manner.

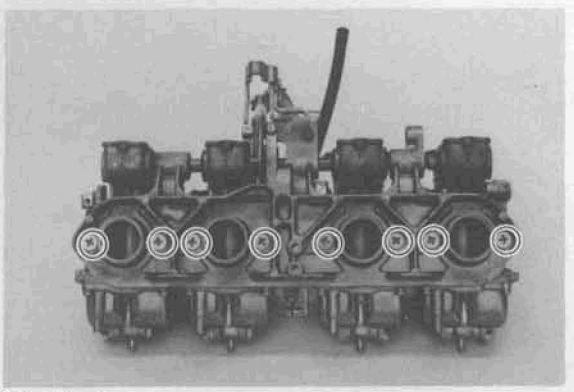


Fig. 9-15

Re-assembly

- Carburetor identification
  Be sure to identify each carburetor for the cylinder which it serves and to mount each in the correct position as indicated:

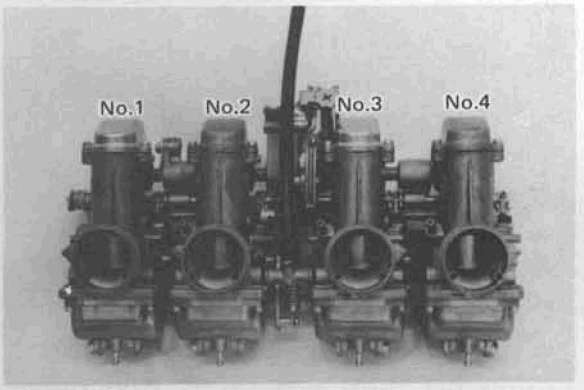


Fig. 9-16

- Grease the throttle shaft, and install it in the carburetor. Leave the throttle shaft screw loose.

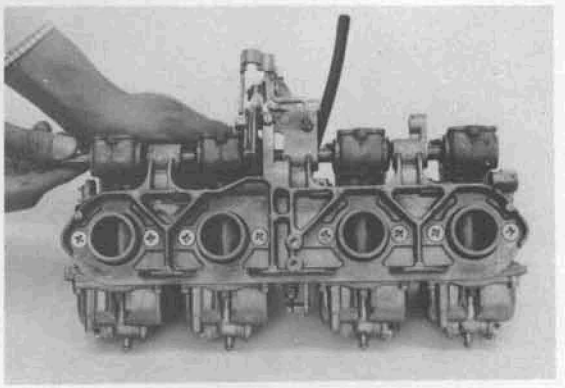


Fig. 9-17

- Secure the plate by tightening the 8 screws. Be sure to apply THREAD LOCK CEMENT (99000-32040) to these screws before tightening them.

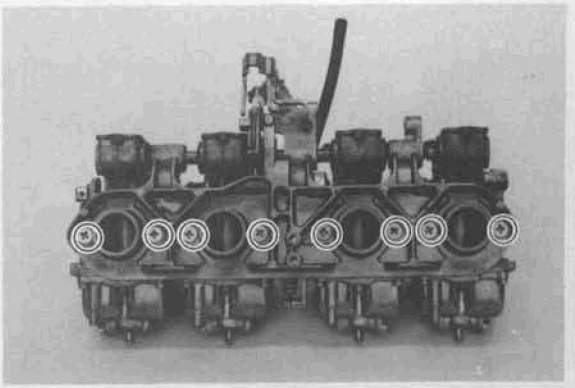


Fig. 9-18

- Tighten bolt ① to this torque value:

Tightening torque	0.35 kg-m (2.5 lb-ft)

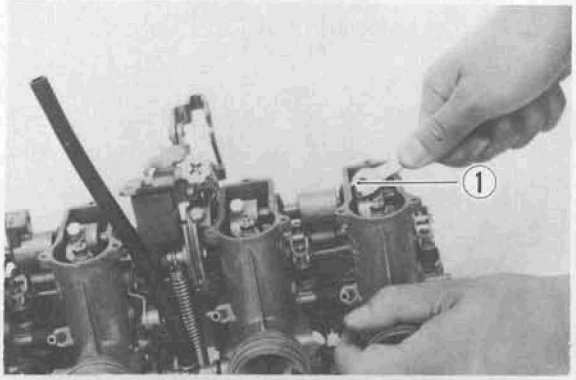


Fig. 9-19

- Adjusting full-open and full-closed positions of throttle valves and balance the carburetors.

FULL-CLOSED POSITION

Run back throttle stop screw ① to produce a clearance between the screw and pulley.

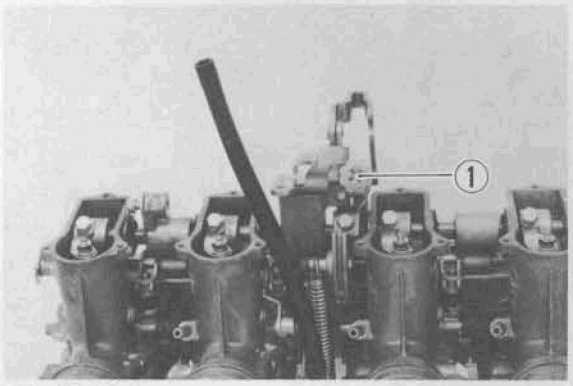


Fig. 9-20

Loosen the locknuts and turn the adjusting screws ① so that the four carburetor throttle valves are aligned with the bottom end of the main bore.

Move the throttle valves up and down 2 or 3 times to make sure that the four throttle valves are positioned evenly, and tighten the locknuts ② .

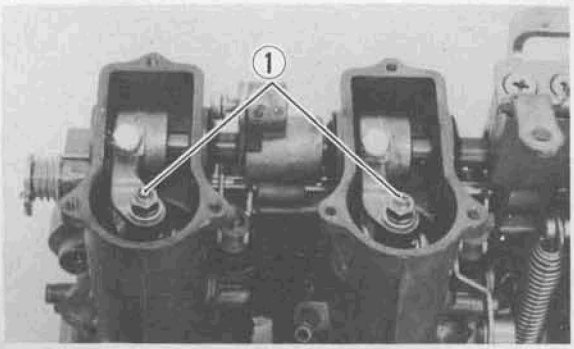


Fig. 9-21

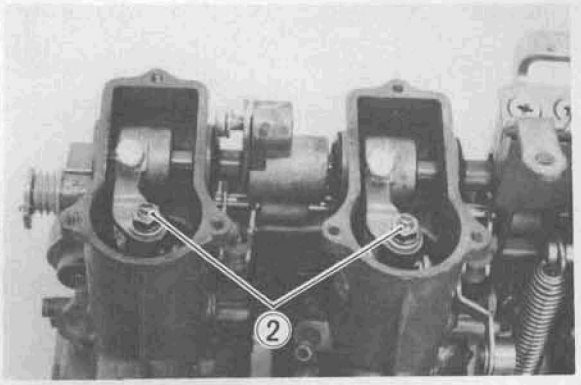


Fig. 9-22

FULL-OPEN POSITION

Adjust full-throttle stopper ① in such a way that, when the throttle valve is turned to its full-open position, the valve will come to the position indicated.

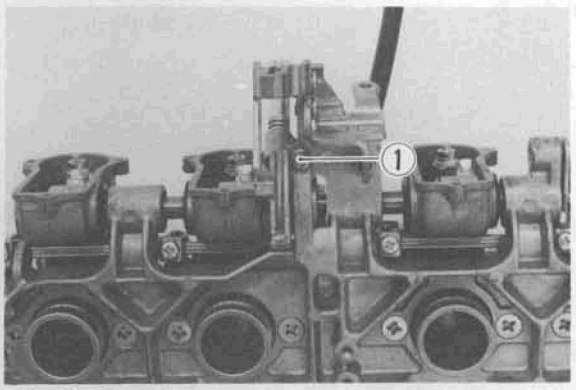


Fig. 9-23

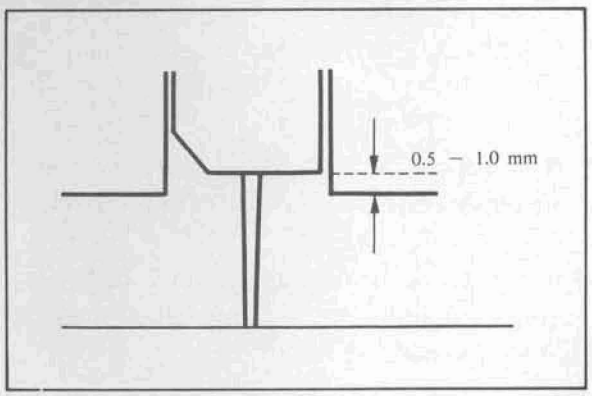


Fig. 9-24

Checking fuel level in each float chamber

1. Leave fuel cock lever in "ON" or "RES" position.
2. Place machine on center stand.
3. Remove float chamber screw and install the special tool.
4. Move fuel cock lever to "PRI" position to admit fuel into float chamber.

5. With the float chamber filled with fuel, turn the cock lever back to "ON" position, and start up the engine.
6. Run the engine at the idling speed (950—1 150 r/min), and measure distance Ⓐ with the middle line of the level gauge aligned with the mating surface of the float bowl as shown in the photo. Ⓐ should be within the range specified here.

Distance Ⓐ	3.0–5.0 mm (0.11–0.19 in)

Fuel level gauge	09913-14510

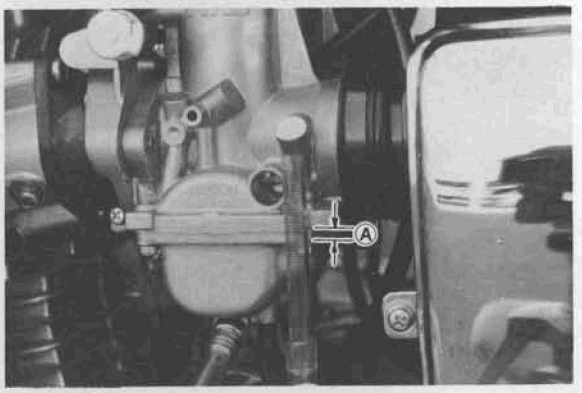


Fig. 9-25

Fuel level measurement

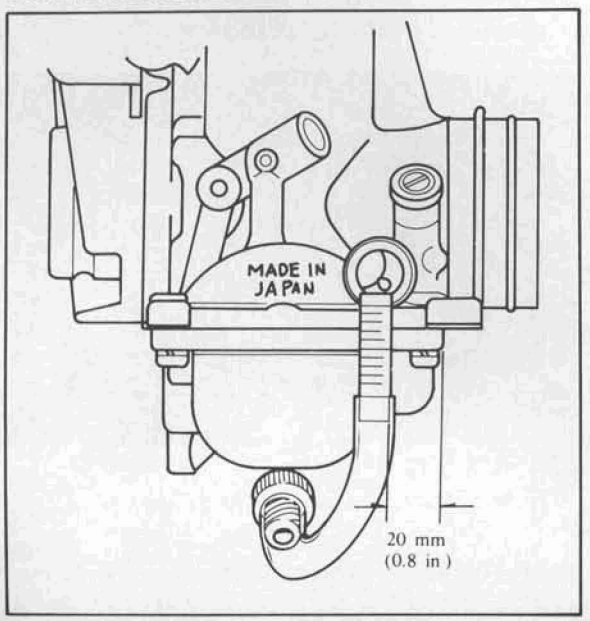


Fig. 9-26

NOTE:
When checking the fuel level, place the machine on the center stand. The fuel level should be 20 mm (0.8 in) above the rear end of the float chamber.

Fuel level adjustment

- If distance Ⓐ is not within the specified range, it means that float height Ⓗ is off the specification. To adjust this height, proceed as follows:
  Remove the float bowl, and bend the float arm to increase or decrease the height to this value:

Float height Ⓗ	23–25 mm (0.90–0.98 in)

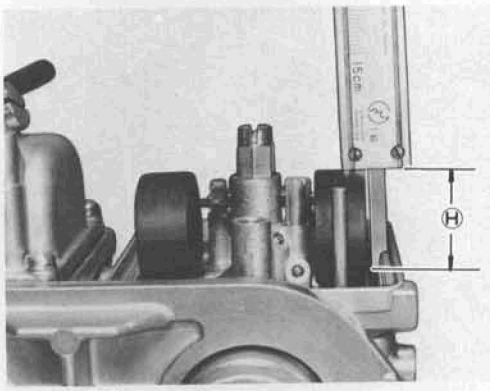


Fig. 9-27

IMPORTANT:
Be sure to remove the gasket before measuring the height.

- Moving the arm upward toward Ⓐ raises the level; moving it downward toward Ⓑ lowers the level (in the inverted condition of the carburetor).

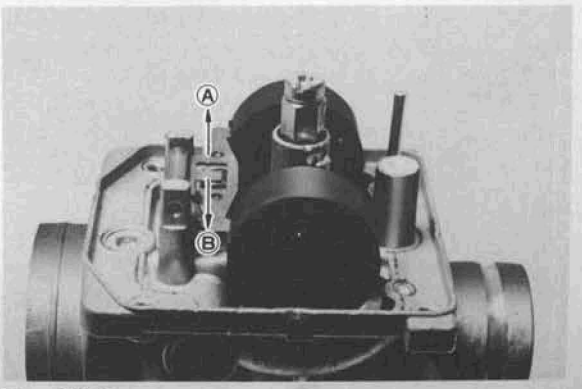


Fig. 9-28

Balancing the carburetors

The four carburetors must be balanced after disassembling the engine or the carburetors. As a first step, calibrate the carburetor balancer gauge ① (special tool) as follows:

1. Remove the vacuum inlet screw (Allen bolt) on No. 4 carburetor or No. 1 carburetor intake pipe using a 4 mm hexagon wrench (special tool), and install the adaptor ② (special tool) in the screw hole.

Hexagon wrench 4 mm	09911-70130

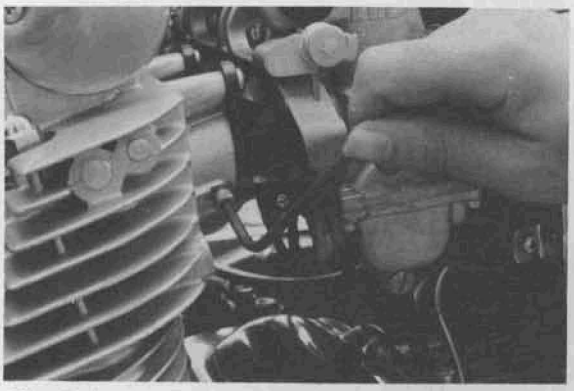


Fig. 9-29

2. Connect one of the four rubber hoses of the balance gauge to this adaptor.
3. Start up the engine, and keep it running at 1500—2000 r/min.

Carburetor balancer set	09913-13121

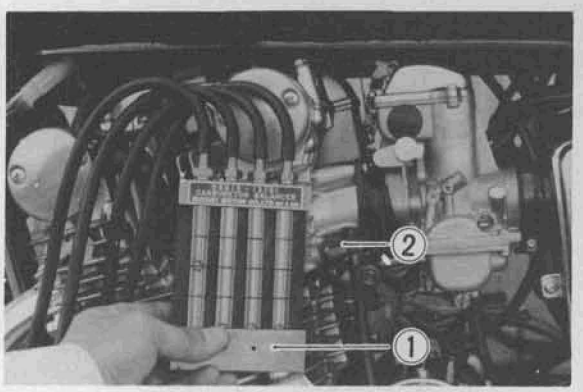


Fig. 9-30

4. Turn the air screw of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball in the tube to the center.

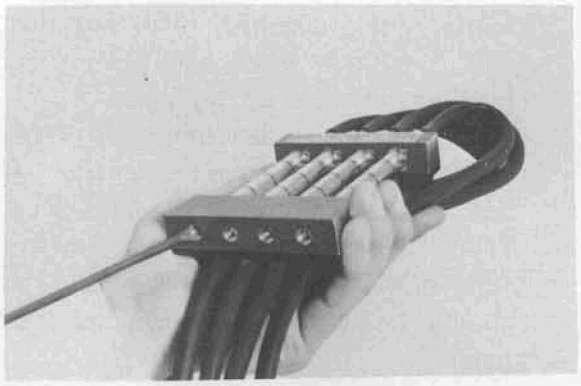


Fig. 9-31

5. After finishing with one hose, connect the adapter to the next hose and, by adjusting the next air screw, bring the steel ball in that tube to the center line.

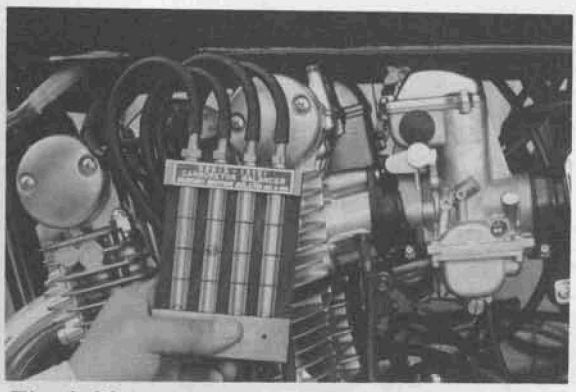


Fig. 9-32

6. Repeat the process on the third and fourth tubes. The balancer gauge is now ready for use in balancing the carburetors.

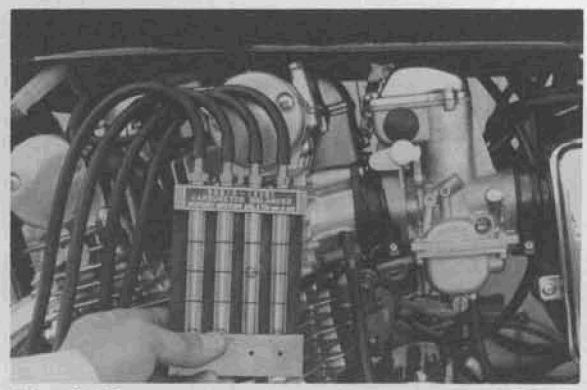


Fig. 9-33

Remove the respective vacuum inlet screws and insert the adapters in the holes. Connect the balancer gauge hoses to these adaptors, one hose to one adapter, and balance the four carburetors as follows:

- Start up the engine, and keep it running at 1500—2000 r/min.
- The four steel balls in the carburetor balancer should line up, indicating that the four carburetors are well balanced.

NOTE:
If adjustment is required, it is suggested that the fuel tank and the carburetors top covers be removed beforehand.

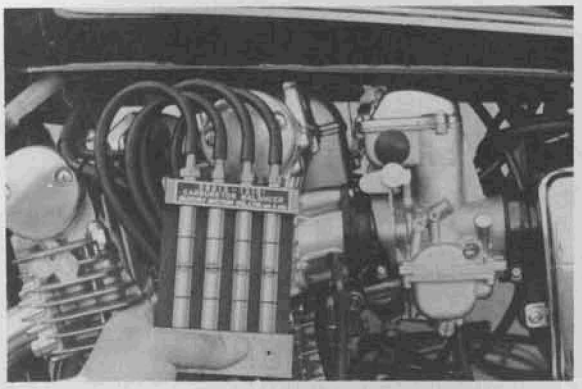


Fig. 9-34

- If the steel balls are not in the correct positions as shown in the above diagram, remove the carburetor top cover, and correctly adjust the throttle valve adjusting screw with special tool ① .

Throttle valve adjust wrench	09913-14520

Fig. 9-35

- After this adjustment, adjust the idling speed to somewhere between 950 and 1150 r/min with throttle stop adjusting screw ① .

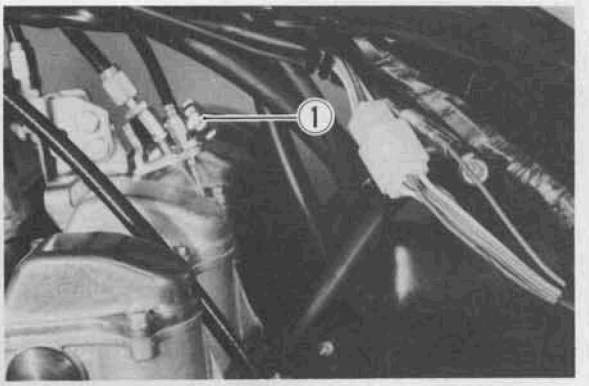


Fig. 9-36

- Install the top covers on the carburetors which have been adjusted.
- Remove the adapters from the intake manifolds and install the vacuum inlet screws.

Throttle cable adjustment

- See page 3-13 for throttle cable adjustment.

NOTE:
If engine is run with fuel tank removed, be sure to plug the petcock vacuum line.

TROUBLE SHOOTING

Before adjusting the carburetors, be sure to check that there is nothing wrong with the engine's compression, ignition timing, and ignition spark performance.

Complaint	Symptom and possible causes	Remedy
Trouble with starting	1. Starter jet is clogged.	1. Clean.
	2. Starter pipe is clogged.	2. Clean.
	3. Air leaking from a joint between starter body and carburetor.	3. Check starter body and carburetor for tightness, adjust and replace gasket.
	4. Air leaking from carburetor's joint or vacuum gauge joint.	4. Check and adjust.
	5. Starter plunger is not operating properly.	5. Check and adjust.
Idling or low-speed trouble	1. Pilot jet, pilot air jet are clogged or loose.	1. Check and clean.
	2. Air leaking from carburetor's joint, vacuum gauge joint, or starter.	2. Check and adjust.
	3. Pilot outlet or bypass is clogged.	3. Check and clean.
	4. Starter plunger is not fully closed.	4. Check and adjust.
Medium- or high-speed trouble	1. Main jet or main air jet is clogged.	1. Check and clean.
	2. Needle jet is clogged.	2. Check and clean.
	3. Fuel leaking due to a broken O-ring in needle jet.	3. Replace O-ring.
	4. Throttle valve is not operating properly.	4. Check throttle valve for operation.
	5. Filter is clogged.	5. Check and clean.
Overflow and fuel level fluctuations	1. Needle valve is worn or damaged.	1. Replace.
	2. Spring in needle valve is broken.	2. Replace.
	3. Float is not working properly.	3. Check and adjust.
	4. Foreign matter has adhered to needle valve.	4. Clean.
	5. Fuel level is too high or low.	5. See page 9-9 .

GS850GD/GLD

This section gives service data and servicing procedures which differ those of the GS850-GZ/GLZ and describes the new features of the GS850GD/GLD. Refer to the sections 1 through 18 except for the items described in this section.

CONTENTS

I.	*VIEW OF SUZUKI GS850GD*	*19-2*
	SPECIFICATIONS	*19-3*
	PERIODIC MAINTENANCE	*19-5*
	WIRING DIAGRAM	*19-6*
	WIRE AND CABLE ROUTING	*19-7*
	TIGHTENING TORQUE	*19-9*
	SERVICE DATA	*19-12*
II.	*VIEW OF SUZUKI GS850GLD*	*19-22*
	SPECIFICATIONS	*19-23*
	PERIODIC MAINTENANCE	*19-25*
	IGNITION SYSTEM	*19-26*
	WIRING DIAGRAM	*19-28*
	WIRE AND CABLE ROUTING	*19-29*
	TIGHTENING TORQUE	*19-31*
	SERVICE DATA	*19-33*

I. VIEW OF SUZUKI GS850GD

RIGHT SIDE

LEFT SIDE

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 195 mm (86.4 in)
Overall width	865 mm (34.1 in)
Overall height	1 190 mm (46.9 in)
Wheelbase	1 500 mm (59.1 in)
Ground clearance	170 mm (6.7 in)
Seat height	795 mm (31.3 in)
Dry mass	245 kg (540 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm^3 (51.4 cu. in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS32SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch		Wet multi-plate type
Transmission		5-speed constant mesh
Gearshift pattern		1-down, 4-up
Primary reduction		1.775 (87/49)
Gear ratios,	Low	2.500 (35/14)
	2nd	1.777 (32/18)
	3rd	1.380 (29/21)
	4th	1.125 (27/24)
	Top	0.961 (25/26)

SECONDARY DRIVE

Type	Sahft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swingign arm, oil dampened, damper 4-way/ spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 10′
Trail	*116 mm (4.57 in)
Turning radius	*2.5 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50H19 4PR (Tubeless tire)
Rear tire size	4.50H17 4PR (Tubeless tire)
Front tire pressure	1.75 kg/cm² (24 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve	22 L (5.8 US gal)
reserve	4.2 L (4.4 US qt)
Engine oil change	3.0 L (3.2 US qt)
filter change	3.6 L (3.8 US qt)
overhaul	3.8 L (4.0 US qt)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure	0.6 kg/cm² (8.5 psi)
Front fork oil	255 ml (8.62 US oz) in each leg

Specifications subject to change without notice.

* Asterisk indicates new D model specifications.

IMPORTANT: The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also enhance the reliability and performance of the motorcycle.

NOTE:
Vehicles operated under severe conditions may require more frequent servicing.

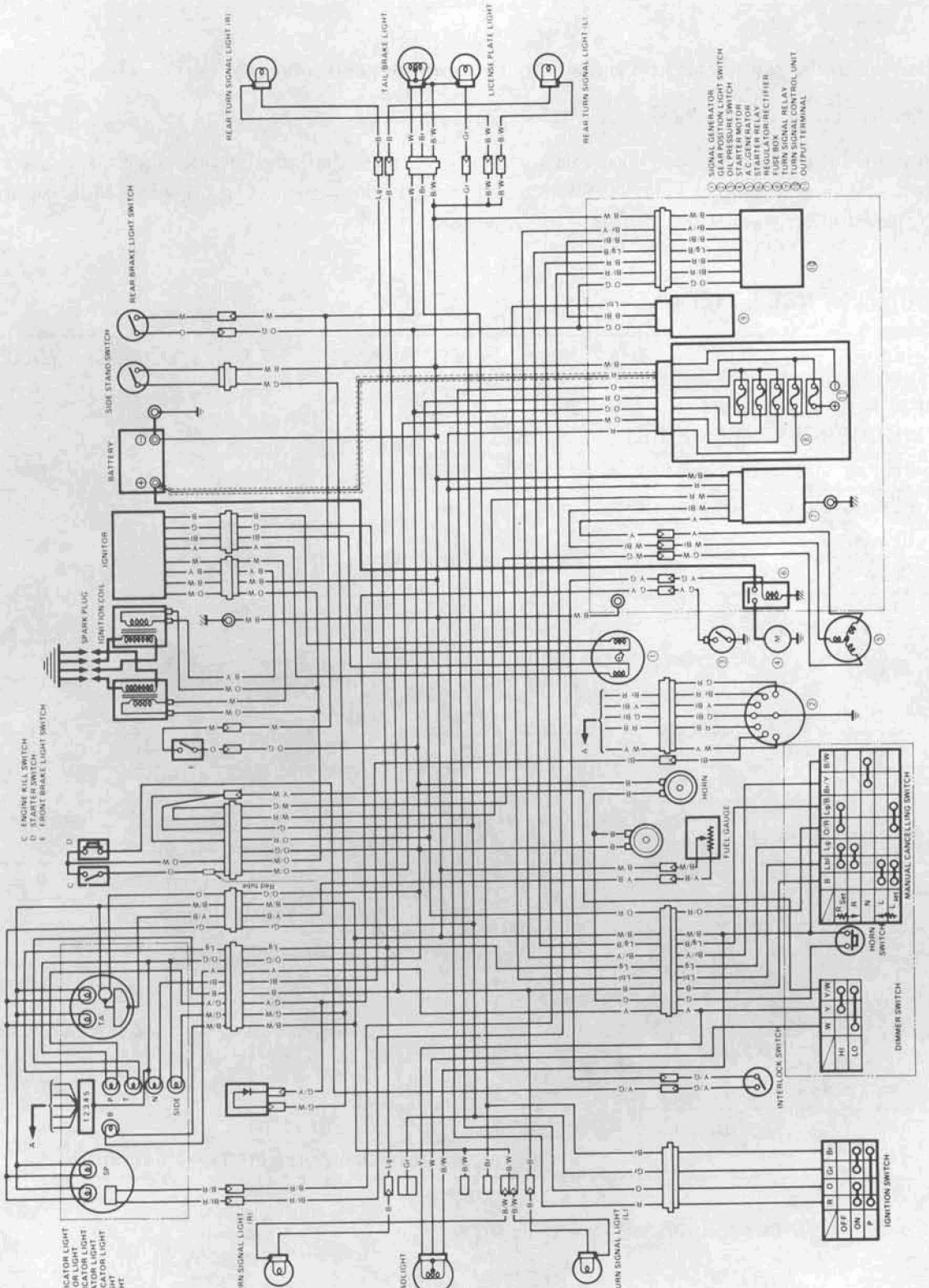
The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and to maintain proper emission levels. Mileages are expressed in terms of kilometers, miles and time for your convenience.

PERIODIC MAINTENANCE SCHEDULE

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST						
	Mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		–	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		–	C	C	C	C
Tappet clearance		I	I	I	I	I
Spark plug		–	C	R	C	R
Fuel line		I	I	I	I	I
		Replace every four years				
Engine oil and oil filter		R	R	R	R	R
Engine idle speed		I	I	I	I	I
Clutch		I	I	I	I	I
Secondary and Final gear oil		Change oil at initial 600 miles (1 000 km) every 7 500 miles (12 000 km)				
Brake hose		I	I	I	I	I
		Replace every four years				
Brake fluid		Change every two years				
Brake		I	I	I	I	I
Tires		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front forks		–	–	I	–	I
		Check air pressure every 6 months.				

NOTE: T = Tighten, I = Inspect, R = Replace, C = Clean

WIRING DIAGRAM

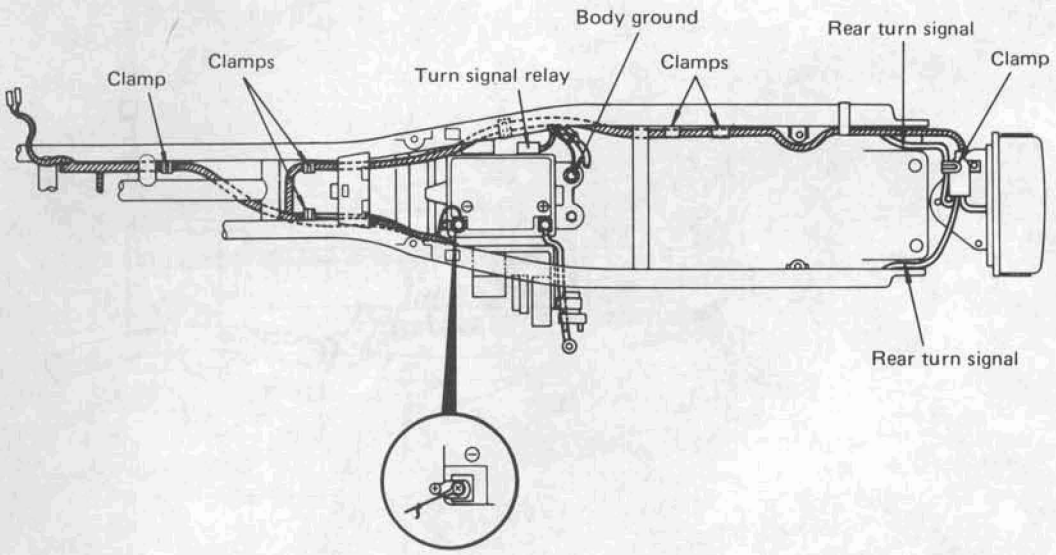


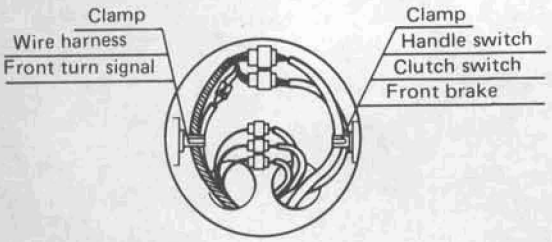
WIRE COLOR

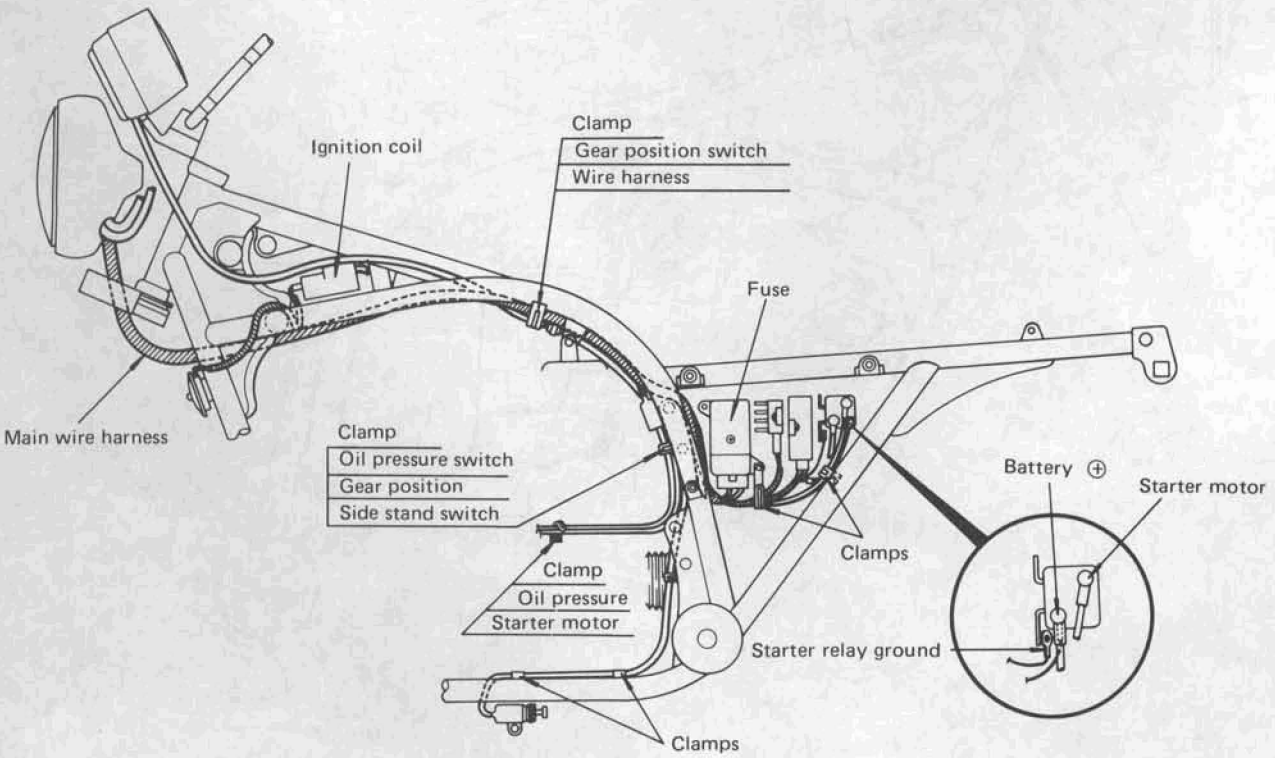
B	Black	R	Red
Bl	Blue	O	Orange
Br	Brown	W	White
G	Green	Y	Yellow
Gr	Gray	B/Bl	Black with Blue tracer
Lbl	Light blue	B/R	Black with Red tracer
Lg	Light green	B/W	Black with White tracer

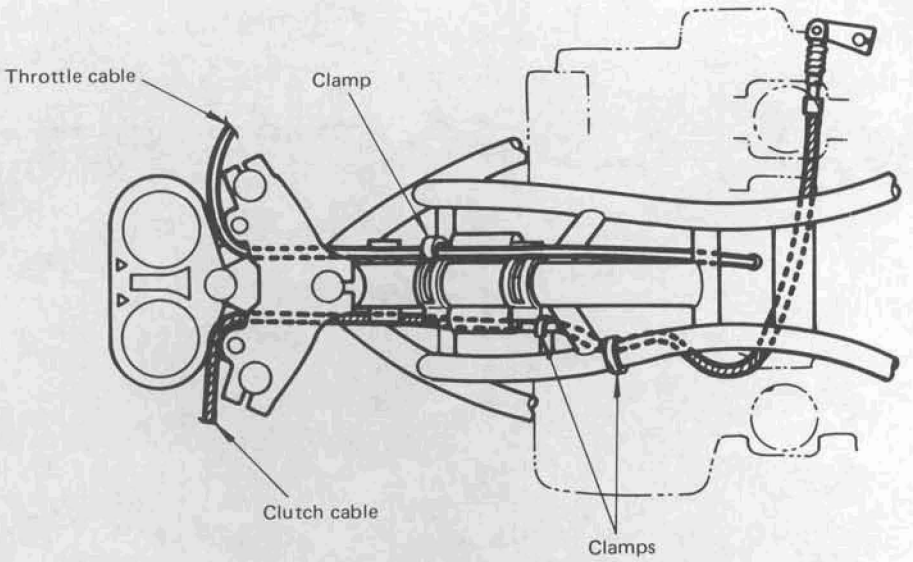
B/Y	Black with Yellow tracer	O/R	Orange with Red tracer
Bl/R	Blue with Red tracer	O/W	Orange with White tracer
Br/Y	Brown with Yellow tracer	W/Bl	White with Blue tracer
G/W	Green with White tracer	W/R	White with Red tracer
G/Y	Green with Yellow tracer	Y/B	Yellow with Black tracer
Lg/B	Light green with Black tracer	Y/G	Yellow with Green tracer
O/G	Orange with Green tracer	Y/W	Yellow with White tracer

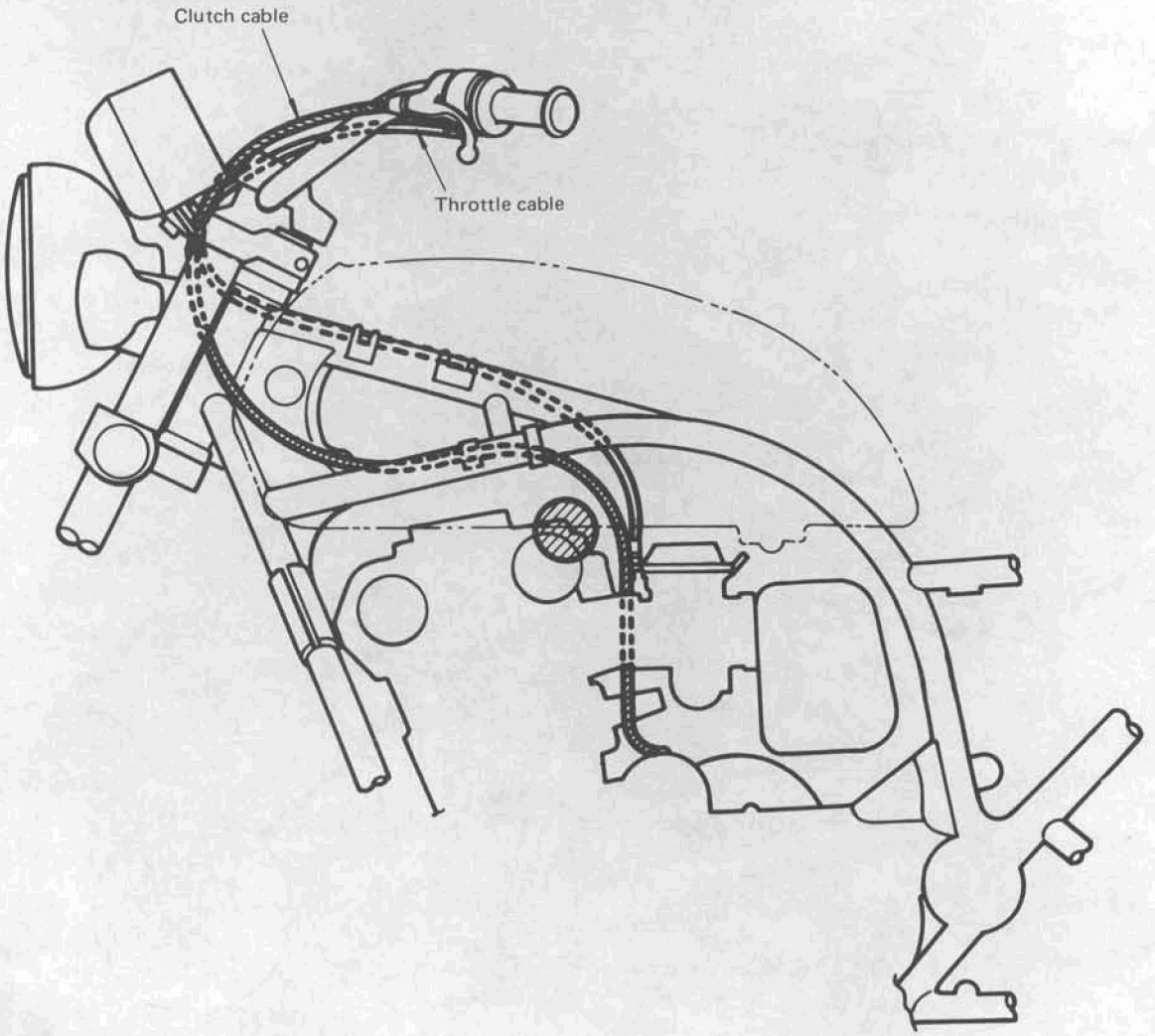
WIRE AND CABLE ROUTING








Throttle cable
Clamp
Clutch cable
Clamps


Clutch cable
Throttle cable

TIGHTENING TORQUE

ENGINE

ITEM	N·m	kg-m	lb-ft
Cylinder head cover bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Cylinder head bolt	7 – 11	0.7 – 1.1	5.0 – 8.0
Cylinder head nut	35 – 40	3.5 – 4.0	25.5 – 29.0
Camshaft bearing cap bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Camshaft sprocket bolt	24 – 26	2.4 – 2.6	17.5 – 19.0
Cam chain idler bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Cam chain guide No. 2 bolt	4 – 7	0.4 – 0.7	3.0 – 5.0
Generator rotor bolt	60 – 70	6.0 – 7.0	43.5 – 50.5
Signal rotor bolt	25 – 35	2.5 – 3.5	18.0 – 25.5
Starter motor bolt	4 – 7	0.4 – 0.7	3.0 – 5.0
Starter clutch bolt	15 – 20	1.5 – 2.0	11.0 – 14.5
Clutch sleeve hub nut	50 – 70	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	11 – 13	1.1 – 1.3	8.0 – 9.5
Clutch release arm bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Oil strainer screw	6 – 10	0.6 – 1.0	4.5 – 7.0
Gear shifting cam stopper spring holder bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Gear shift arm stopper bolt	15 – 23	1.5 – 2.3	11.0 – 16.5
Crankcase bolt (6 mm)	6 – 10	0.6 – 1.0	4.5 – 7.0
Crankcase bolt (8 mm)	18 – 22	1.8 – 2.2	13.0 – 16.0
Engine mounting nut (10 mm)	25 – 45	2.5 – 4.5	18.0 – 32.5
Engine mounting nut (12 mm)	45 – 70	4.5 – 7.0	32.5 – 50.5
Exhaust pipe bolt	9 – 14	0.9 – 1.4	6.5 – 10.0
Muffler bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Gear shift lever bolt	13 – 23	1.3 – 2.3	9.5 – 16.5
Secondary drive gear nut	120 – 150	12.0 – 15.0	87.0 – 108.5
Secondary driven gear nut	90 – 110	9.0 – 11.0	65.0 – 79.5
Secondary drive housing bolt	20 – 26	2.0 – 2.6	14.5 – 19.0
Secondary driven housing bolt	20 – 26	2.0 – 2.6	14.5 – 19.0

CHASSIS

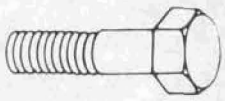
ITEM	N·m	kg-m	lb-ft
Handlebar clamp bolt	12 – 20	1.2 – 2.0	8.5 – 14.5
Steering stem upper clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Front fork upper bracket bolt (R, L)	20 – 30	2.0 – 3.0	14.5 – 21.5
Front fork lower bracket bolt (R, L)	15 – 25	1.5 – 2.5	11.0 – 18.0
Steering stem head bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
Front fork axle holder nut	15 – 25	1.5 – 2.5	11.0 – 18.0
Front fork damper rod bolt	20 – 26	2.0 – 2.6	14.5 – 19.0
Front axle shaft nut	36 – 52	3.6 – 5.2	26.0 – 37.5
Swinging arm pivot bolt	3.5 – 4.5	0.35 – 0.45	2.5 – 3.0
Swinging arm pivot nut	110 – 130	11.0 – 13.0	79.5 – 94.0
Rear torque link nut	20 – 30	2.0 – 3.0	14.5 – 21.5
Rear axle nut	50 – 80	5.0 – 8.0	36.0 – 58.0
Rear shock absorber nut	20 – 30	2.0 – 3.0	14.5 – 21.5
Footrest bolt	27 – 43	2.7 – 4.3	19.5 – 31.0
Front brake caliper mounting bolt	25 – 40	2.5 – 4.0	18.0 – 29.0
Front and rear brake disc plate bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Front brake caliper axle bolt	15 – 20	1.5 – 2.0	11.0 – 14.5
Front brake master cylinder mounting bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
Front and rear brake hose union bolt	13 – 18	1.3 – 1.8	9.5 – 13.0
Front and rear brake oil bleeder bolt	6 – 9	0.6 – 0.9	4.5 – 6.5
Rear brake caliper mounting bolt	20 – 30	2.0 – 3.0	14.5 - 21.5
Rear brake caliper axle bolt	25 – 35	2.5 – 3.5	18.0 – 25.5
Rear brake master cylinder mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Final drive gear nut	90 – 110	9.0 – 11.0	65.0 – 79.5
Final drive gear housing nut	35 – 45	3.5 – 4.5	25.5 – 32.5
Propeller shaft bolt	30 – 40	3.0 – 4.0	21.5 – 29.0
Final gear bearing case bolt	20 – 26	2.0 – 2.6	14.5 – 19.0
Final gear case shock mount stud bolt	90 – 110	9.0 – 11.0	65.0 – 79.5
Final case oil filler plug	20 – 30	2.0 – 3.0	14.5 – 21.5

TIGHTENING TORQUE CHART

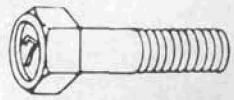
For other bolts and nuts not listed on previous pages, refer to this chart:

TIGHTENING TORQUE

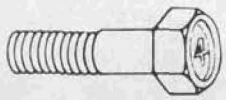
Thread Diameter (mm)	Conventional or "4" Marked Bolt			"7" Marked Bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1 – 2	0.1 – 0.2	0.7 – 1.5	1.5 – 3	0.15 – 0.3	1.0 – 2.0
5	2 – 4	0.2 – 0.4	1.5 – 3.0	3 – 6	0.3 – 0.6	2.0 – 4.5
6	4 – 7	0.4 – 0.7	3.0 – 5.0	8 – 12	0.8 – 1.2	6.0 – 8.5
8	10 – 16	1.0 – 1.6	7.0 – 11.5	18 – 28	1.8 – 2.8	13.0 – 20.0
10	22 – 35	2.2 – 3.5	16.0 – 25.5	40 – 60	4.0 – 6.0	29.0 – 43.5
12	35 – 55	3.5 – 5.5	25.5 – 40.0	70 – 100	7.0 – 10.0	50.5 – 72.5
14	50 – 80	5.0 – 8.0	36.0 – 58.0	110 – 160	11.0 – 16.0	79.5 – 115.5
16	80 – 130	8.0 – 13.0	58.0 – 94.0	170 – 250	17.0 – 25.0	123.0 – 181.0
18	130 – 190	13.0 – 19.0	94.0 – 137.5	200 – 280	20.0 – 28.0	144.5 – 202.5



Conventional Bolt



"7" Marked Bolt



"4" Marked Bolt

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	36 (1.4)	———
	EX.	30 (1.2)	———
Valve lift	IN.	8.0 (0.31)	———
	EX.	7.5 (0.30)	———
Tappet clearance (when cold)	IN. & EX.	0.03—0.08 (0.001—0.003)	
Valve guide to valve stem clearance	IN.	0.025—0.055 (0.0009—0.0022)	0.35 (0.014)
	EX.	0.040—0.070 (0.0016—0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000—7.015 (0.2756—0.2762)	———
Valve stem O.D.	IN.	6.960—6.975 (0.2740—0.2746)	———
	EX.	6.945—6.960 (0.2734—0.2740)	———
Valve stem runout	IN. & EX.	———	0.05 (0.002)
Valve head thickness	IN. & EX.	———	0.5 (0.02)
Valve stem end length	IN. & EX.	———	4.4 (0.17)
Valve seat width	IN. & EX.	1.0—1.2 (0.04—0.05)	———
Valve head radial runout	IN. & EX.	———	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	———	33.9 (1.33)
	OUTER	———	41.3 (1.63)
Valve spring tension (IN. & EX.)	INNER	8.9—12.5 kg (19.62—27.56 lbs) at length 31 mm (1.22 in)	———
	OUTER	22.1—27.1 kg (48.72—59.74 lbs) at length 35 mm (1.38 in)	———

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.32–36.36 (1.430–1.432)	36.02 (1.418)
	EX.	35.77–35.81 (1.408–1.410)	35.47 (1.397)
Camshaft journal oil clearance	IN. & EX.	0.037–0.065 (0.0015–0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012–22.025 (0.8666–0.8671)	———
Camshaft journal O.D.	IN. & EX.	21.960–21.975 (0.8646–0.8652)	———
Camshaft runout	IN. & EX.	———	0.10 (0.004)
Cam chain 20 pitch length		———	157.80 (6.213)
Cam chain pin (at arrow "3")		20 th pin	———
Cylinder head distortion		———	0.2 (0.008)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	9 – 12 kg/cm² (128 – 171 psi)			7 kg/cm² (100 psi)
Compression pressure difference	———			2 kg/cm² (28 psi)
Piston to Cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)			0.120 (0.0047)
Cylinder bore	69.000 – 69.015 (2.7165 – 2.7171)			69.080 (2.7197)
Piston diam.	68.945 – 68.960 (2.7144 – 2.7150) Measure at the 15 mm (0.59 in) from piston skirt end.			68.880 (2.7118)
Cylinder distortion	———			0.2 (0.008)
Piston ring free end gap	1st	N	Approx. 9.0 (0.35)	7.2 (0.28)
	2nd	N	Approx. 11.5 (0.45)	9.2 (0.36)

Piston ring end gap	1st	0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
	2nd	0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
Piston ring groove clearance	1st	———	0.18 (0.0071)
	2nd	———	0.15 (0.0059)
Piston ring groove width	1st	1.21 – 1.23 (0.047 – 0.048)	———
	2nd	1.21 – 1.23 (0.047 – 0.048)	———
	Oil	2.51 – 2.53 (0.099 – 0.100)	———
Piston ring thickness	1st	1.175 – 1.190 (0.0463 – 0.0469)	———
	2nd	1.170 – 1.190 (0.0461 – 0.0469)	———
Piston pin bore I.D.		16.002 – 16.008 (0.6300 – 0.6302)	16.030 (0.6311)
Piston pin O.D.		15.995 – 16.000 (0.6297 – 0.6300)	15.980 (0.6291)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.006–16.014 (0.6302–0.6305)	16.040 (0.6315)
Conrod deflection	———	3.0 (0.12)
Conrod big end side clearance	0.10–0.65 (0.004–0.026)	1.0 (0.039)
Crankshaft runout	———	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	———
Oil pressure (at 60°C, 140°F)	Above 0.1 kg/cm² (1.4 psi) Below 0.25 kg/cm² (3.6 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2—3 (0.08—0.12)	———
Drive plate thickness	2.7—2.9 (0.106—0.114)	2.4 (0.094)
Drive plate claw width	11.8—12.0 (0.46—0.47)	11.0 (0.43)
Driven plate thickness	2.0 ± 0.06 (0.08 ± 0.002)	———
Driven plate distortion	———	0.1 (0.004)
Clutch spring free length	———	38.4 (1.51)

TRANSMISSION

Unit: mm (in) Except ratio

ITEM	STANDARD		LIMIT
Primary reduction	1.775 (87/49)		———
Secondary reduction	1.062 (17/16)		———
Final reduction	3.090 (34/11)		———
Gear ratios	Low	2.500 (35/14)	———
	2nd	1.777 (32/18)	———
	3rd	1.380 (29/21)	———
	4th	1.125 (27/24)	———
	Top	0.961 (25/26)	———
Shift fork to Groove clearance	0.4 – 0.6 (0.016 – 0.024)		0.8 (0.031)
Shift fork groove width	5.45 – 5.55 (0.215 – 0.219)		———
Shift fork thickness	4.95 – 5.05 (0.195 – 0.199)		———

SHAFT DRIVE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Secondary bevel gear backlash	0.08 – 0.13 (0.003 – 0.005)		———
Final bevel gear backlash	Drive side	0.03 – 0.64 (0.001 – 0.025)	———
	Driven side	0.02 – 0.35 (0.001 – 0.014)	
Secondary drive bevel gear preload	3 – 5 kg·cm (2.60 – 4.35 lb·in)		———
Secondary driven bevel gear preload	4 – 7 kg·cm (3.45 – 6.05 lb·in)		———
Final drive bevel gear preload	4 – 8 kg·cm (3.45 – 6.95 lb·in)		———

CARBURETOR

Unit: mm (in)

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS32SS
Bore size		32 (1.26)
I.D. No.		45160
Idle r/min.		1 050 ± 100 r/min
Fuel level		5.0 ± 0.5 (0.20 ± 0.02)
Float height		22.4 ± 1.0 (0.88 ± 0.04)
Main jet	(M.J.)	# 115
Main air jet	(M.A.J.)	1.7 (0.07)
Jet needle	(J.N.)	5D50
Needle jet	(N.J.)	X-5
Pilot jet	(P.J.)	# 40
By pass	(B.P.)	1.0 (0.04), 0.8 (0.03), 0.8 (0.03)
Pilot outlet	(P.O.)	0.7 (0.028)
Valve seat	(V.S.)	2.0 (0.08)
Starter jet	(G.S.)	# 32.5
Pilot screw	(P.S.)	PRE-SET
Pilot air jet	(P.A.J.)	# 180
Throttle cable play		0.5 – 1.0 (0.02 – 0.04)
Choke cable play		0.5 – 1.0 (0.02 – 0.04)

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION			NOTE
Ignition timing	17 ° B.T.D.C. Below 1500 ± 150 r/min and 37 ° B.T.D.C. Above 2350 ± 150 r/min.			
Firing order	1, 2, 4, 3,			
Spark plug	Type	NGK : B8ES N.D. : W24ES-U		
	Gap	0.6–0.8 (0.024–0.031)		
Spark performance	Over 8 (0.3) at 1 atm			
Signal coil resistance	140–180 Ω			Bl-Y, G-B
Ignition coil resistance	Primary	⊕ tap – ⊖ tap 3–5 Ω		
	Secondary	Plug cap – Plug cap 30–40 kΩ		
Generator no-load voltage	More than 80 V (AC) at 5000 r/min.			
Regulated voltage	14.0 – 15.5 V at 5000 r/min.			
Starter motor	Brush length	MITSUBA	Limit: 6 (0.24)	
	Commutator under cut		Limit: 0.2 (0.008)	
Starter relay resistance	3–4 Ω			
Battery	Type designation	YB14L-A2		
	Capacity	12V50.4kC(14Ah)/10HR		
	Standard electrolyte S. G.	1.28 at 20°C (68°F)		
Fuse size	Headlight	10 A		
	Turn signal	10 A		
	Ignition	10 A		
	Main	15 A		
	Output terminal	10 A		

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		20 (0.8)	———
Brake disc thickness	Front	5.0 ± 0.2 (0.20 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		———	0.30 (0.012)
Master cylinder bore	Front	15.870–15.913 (0.6248–0.6265)	———
	Rear	14.000–14.043 (0.5512–0.5529)	———
Master cylinder piston diam.	Front	15.827–15.854 (0.6231–0.6242)	———
	Rear	13.957–13.984 (0.5495–0.5506)	———
Brake caliper cylinder bore	Front	38.180–38.256 (1.5031–1.5061)	———
	Rear	38.180–38.256 (1.5031–1.5061)	———
Brake caliper piston diam.	Front	38.098–38.148 (1.4999–1.5019)	———
	Rear	38.098–38.148 (1.4999–1.5019)	———
Wheel rim runout	Axial	———	2.0 (0.08)
	Radial	———	2.0 (0.08)
Wheel axle runout	Front	———	0.25 (0.010)
	Rear	———	0.25 (0.010)
Tire size	Front	3.50H19 4PR (Tubeless tire)	———
	Rear	4.50H17 4PR (Tubeless tire)	———
Tire tread depth	Front	———	1.6 (0.06)
	Rear	———	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	160 (6.30)	———
Front fork spring free length	———	416 (16.4)
Front fork oil level	140 (5.5)	———
Front fork air pressure	0.6 kg/cm² (8.5 psi)	———
Rear wheel travel	110 (4.33)	———

FUEL + OIL + CAPACITY

ITEM	SPECIFICATION	
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve	22 L (5.8 US gal)	
reserve	4.2 L (4.4 US qt)	
Engine oil type	SAE 10W/40	
Engine oil capacity	Change	3 000 ml (3.2 US qt)
	Filter change	3 600 ml (3.8 US qt)
	Overhaul	3 800 ml (4.0 US qt)
Front fork oil type	Fork oil # 15	
Front fork oil capacity (each leg)	255 ml (8.62 US oz)	
Bevel gear oil type	Hypoid Gear oil SAE 90, API grade GL-5	
Bevel gear oil capacity	Secondary	340 – 400 ml (11.5 – 13.5 US oz)
	Final	280 – 330 ml (9.5 – 11.2 US oz)
Brake fluid type	DOT3 or DOT4	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	175	1.75	24	175	1.75	24	200	2.00	28	200	2.00	28
REAR	200	2.00	28	225	2.25	32	225	2.25	32	280	2.80	40

WATTAGE

Unit: W (cp)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
License light		8
Turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
Side stand check light		3.4

II. VIEW OF SUZUKI GS850GLD

RIGHT SIDE

LEFT SIDE

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 250 mm (88.6 in)
Overall width	855 mm (33.7 in)
Overall height	1 130 mm (44.5 in)
Wheelbase	1 510 mm (59.4 in)
Ground clearance	145 mm (5.7 in)
Seat height	765 mm (30.1 in)
Dry mass	243 kg (536 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm^3 (51.4 cu. in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS32SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch		Wet multi-plate type
Transmission		5-speed constant mesh
Gearshift pattern		1-down, 4-up
Primary reduction		1.775 (87/49)
Gear ratios,	Low	2.500 (35/14)
	2nd	1.722 (31/18)
	3rd	1.380 (29/21)
	4th	1.125 (27/24)
	Top	0.923 (24/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 30′
Trail	105 mm (4.13 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	100/90-19 57H (Tubeless tire)
Rear tire size	130/90-16 67H (Tubeless tire)
Front tire pressure	1.75 kg/cm² (24 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normla solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve	17 L (4.5 US gal)
reserve	4.5 L (4.8 US qt)
Engine oil change	3.0 L (3.2 US qt)
filter change	3.6 L (3.8 US qt)
overhaul	3.8 L (4.0 US qt)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure	0.8 kg/cm² (11.4 psi)
Front fork oil	245 ml (8.27 US oz) in each leg

Specifications subject to change without notice.

IMPORTANT: The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also enhance the reliability and performance of the motorcycle.

NOTE:
Vehicles operated under severe conditions may require more frequent servicing.

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and to maintain proper emission levels. Mileages are expressed in terms of kilometers, miles and time for your convenience.

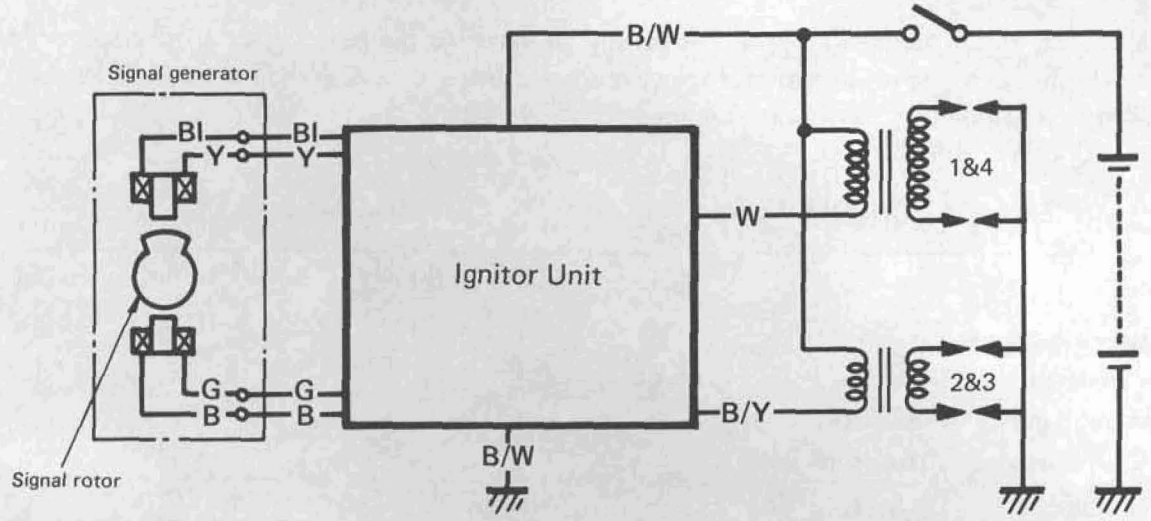
PERIODIC MAINTENANCE SCHEDULE

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST						
	Mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		–	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		–	C	C	C	C
Tappet clearance		I	I	I	I	I
Spark plug		–	C	R	C	R
Fuel line		I	I	I	I	I
		Replace every four years				
Engine oil and oil filter		R	R	R	R	R
Engine idle speed		I	I	I	I	I
Clutch		I	I	I	I	I
Secondary and Final gear oil		Change oil at initial 600 miles (1 000 km) every 7 500 miles (12 000 km)				
Brake hose		I	I	I	I	I
		Replace every four years				
Brake fluid		Change every two years				
Brake		I	I	I	I	I
Tires		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front forks		–	–	I	–	I
		Check air pressure every 6 months.				

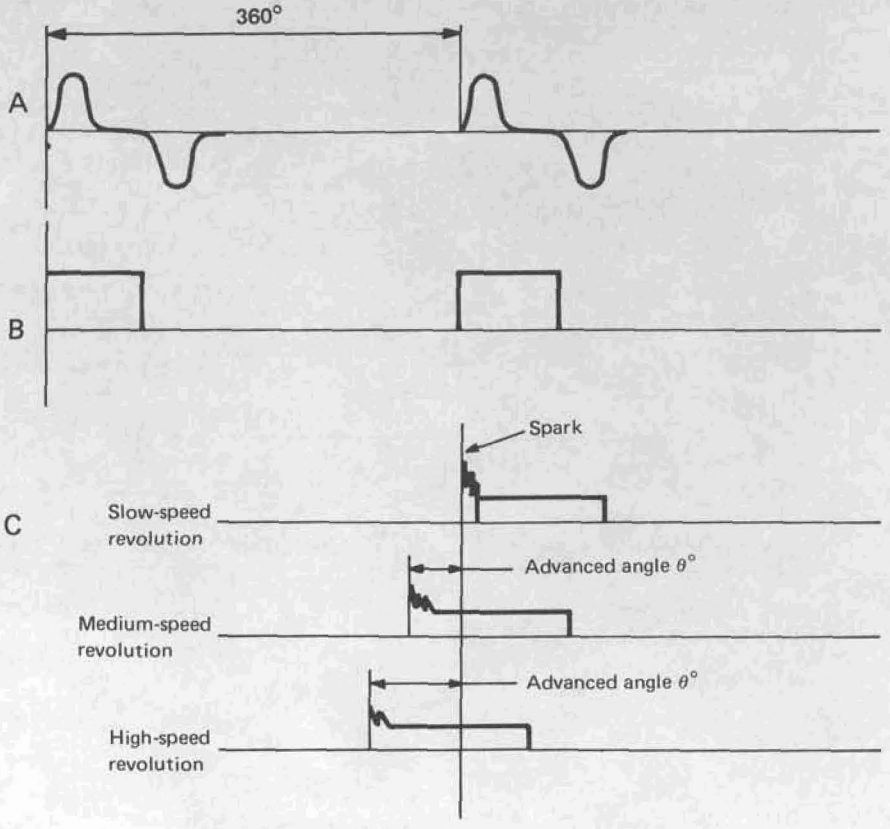
NOTE: T = Tighten, I = Inspect, R = Replace, C = Clean

IGNITION SYSTEM

On the Model GS850GLD, the timing advance characteristics of the ignition timing have been changed from the hitherto-employed mechanical timing advance system incorporating an advance governor to an electronic timing advance system The introduction of this new electronic timing advance system has kept the change in the ignition timing due to time lapse at a minimum level and also has improved the timing advance performance during high-speed operations.



When the signal rotor is rotated in the system block diagram above, the signal "A" is generated in the pick-up coil. The thus-generated signal will be converted to the signal waveform "B" at the inside of the ignitor unit. Based on this "B" waveform, control is made by means of the advancing control circuit and the closing angle control circuit. As a result, the timing advance takes place, as shown in Fig. "C".



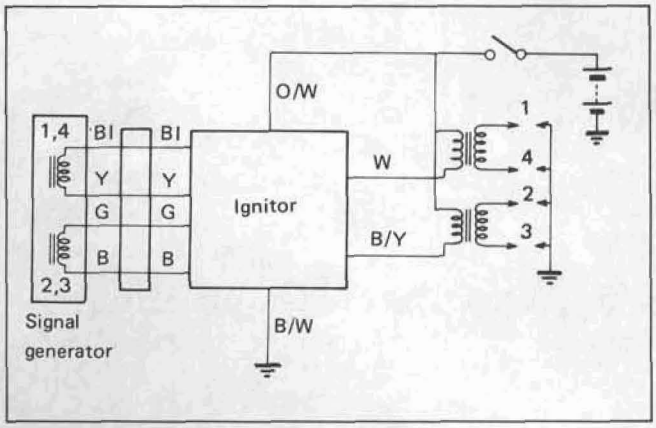
INSPECTION

SIGNAL GENERATOR

Measure the resistance between lead wires. If the resistance is infinity or less than the specifications, the signal generator must be replaced.

09900 - 25002	Pocket tester

STD resistance	
Blue – Yellow	Approx. 140 – 180 Ω
Green – Black	



IGNITOR UNIT

- Remove the spark plugs from Nos. 1 and 2 cylinders. Install the respective plug caps and place spark plug on the cylinder head.
- Remove the frame cover on the left side and disconnect the coupler from the signal generator.
- As indicated in Fig. 1, connect the pocket tester alternately to the terminals provided inside the coupler. For this test, use the "RX1" range of the tester and set the ignition switch at the ON position. If the ignitor unit is functioning normally, a spark will occur at the spark plug at the moment when both of the tester pins ⊕ and ⊖ are removed from the terminals simultaneously.

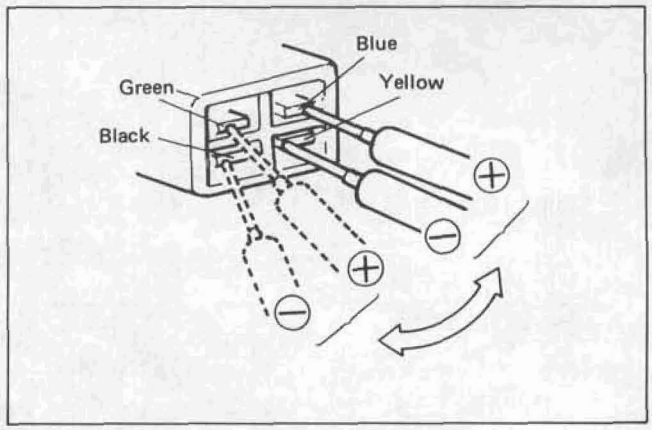
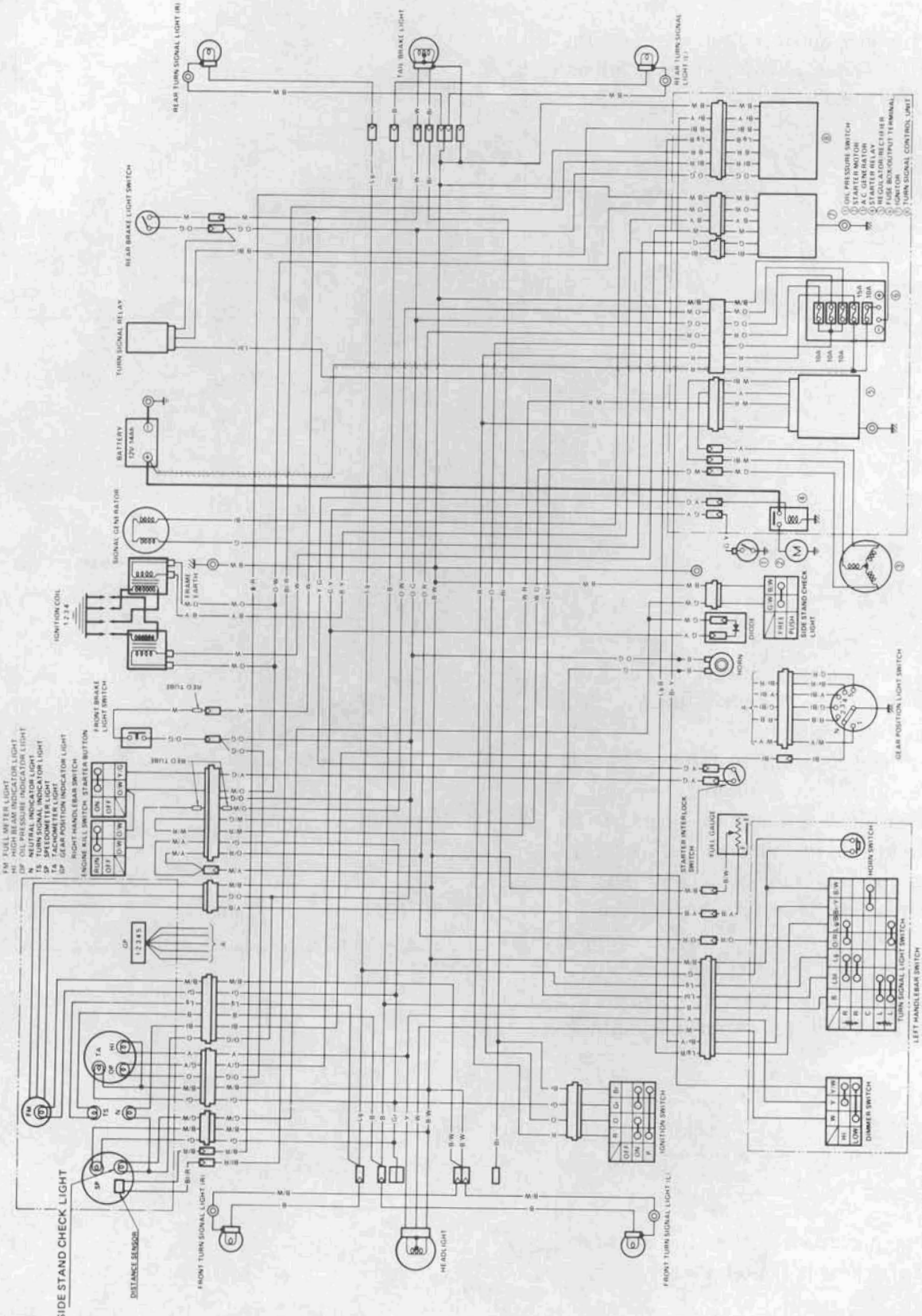


Fig. 1

09900 - 25002	Pocket tester

NOTE:
This checking presupposes that the ignition coil used for checking is a good one.

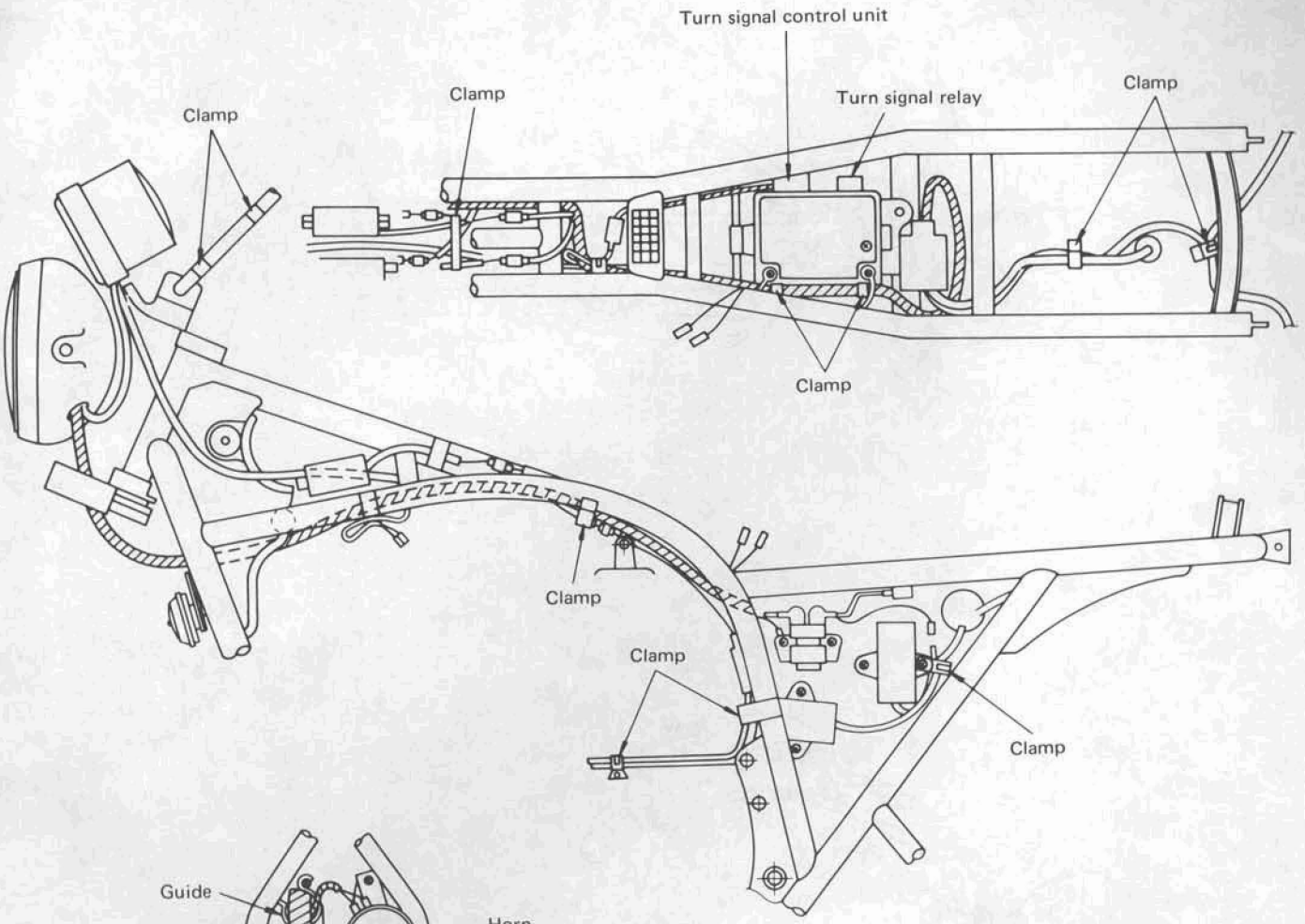
WIRING DIAGRAM

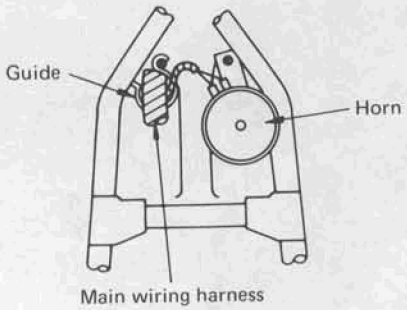


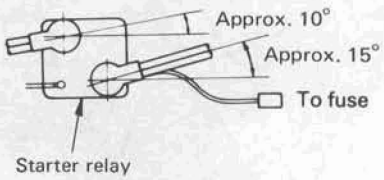
WIRE COLOR

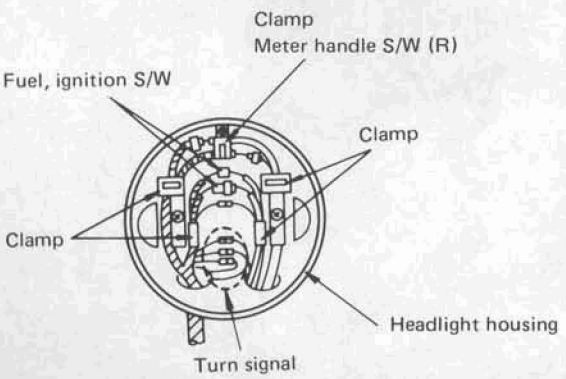
B	Black	R	Red	B/Y	Black with Yellow tracer
Bl	Blue	O	Orange	Bl/R	Blue with Red tracer
Br	Brown	W	White	Br/Y	Brown with Yellow tracer
G	Green	Y	Yellow	G/W	Green with White tracer
Gr	Gray	B/Bl	Black with Blue tracer	G/Y	Green with Yellow tracer
Lbl	Light blue	B/R	Black with Red tracer	Lg/B	Light green with Black tracer
Lg	Light green	B/W	Black with White tracer	O/G	Orange with Green tracer
				O/R	Orange with Red tracer
				O/W	Orange with White tracer
				W/Bl	White with Blue tracer
				W/R	White with Red tracer
				Y/W	Yellow with White tracer
				Y/B	Yellow with Black tracer
				Y/G	Yellow with Green tracer

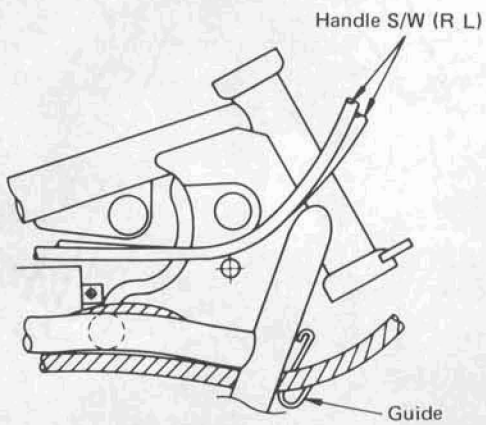
WIRE AND CABLE ROUTING

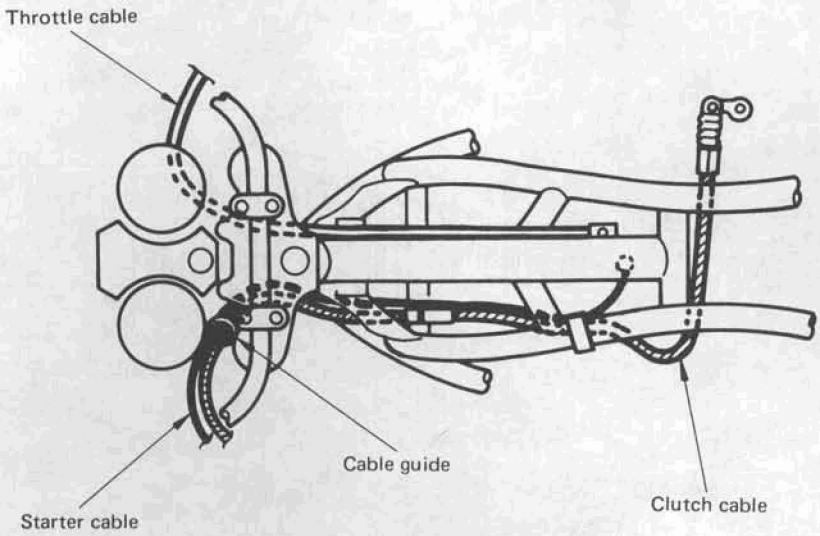


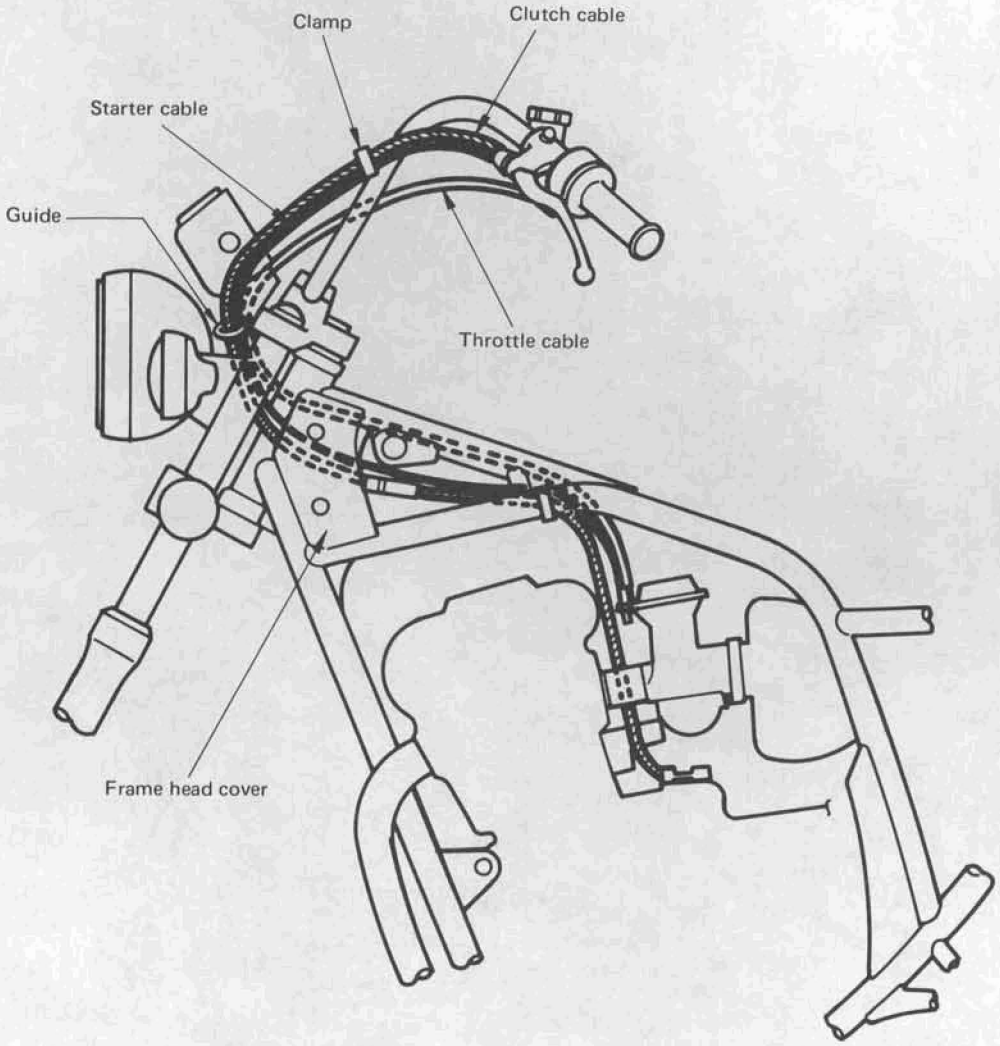









Throttle cable
Cable guide
Clutch cable
Starter cable


Clamp
Clutch cable
Starter cable
Guide
Throttle cable
Frame head cover

TIGHTENING TORQUE

ENGINE

ITEM	N·m	kg-m	lb-ft
Cylinder head cover bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Cylinder head bolt	7 – 11	0.7 – 1.1	5.0 – 8.0
Cylinder head nut	35 – 40	3.5 – 4.0	25.5 – 29.0
Camshaft bearing cap bolt	8 – 12	0.8 – 1.2	6.0 – 8.5
Camshaft sprocket bolt	24 – 26	2.4 – 2.6	17.5 – 19.0
Cam chain idler bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Cam chain guide No. 2 bolt	4 – 7	0.4 – 0.7	3.0 – 5.0
Generator rotor bolt	60 – 70	6.0 – 7.0	43.5 – 50.5
Signal rotor bolt	*25 – 35	*2.5 – 3.5	*18.0 – 25.5
Starter motor bolt	4 – 7	0.4 – 0.7	3.0 – 5.0
Starter clutch bolt	15 – 20	1.5 – 2.0	11.0 – 14.5
Clutch sleeve hub nut	50 – 70	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	11 – 13	1.1 – 1.3	8.0 – 9.5
Clutch release arm bolt	6 – 10	0.6 – 1.0	4.5 – 7.0
Oil strainer screw	6 – 10	0.6 – 1.0	4.5 – 7.0
Gear shifting cam stopper spring holder bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Gear shift arm stopper bolt	15 – 23	1.5 – 2.3	11.0 – 16.5
Crankcase bolt (6 mm)	6 – 10	0.6 – 1.0	4.5 – 7.0
Crankcase bolt (8 mm)	18 – 22	1.8 – 2.2	13.0 – 16.0
Engine mounting nut (10 mm)	25 – 45	2.5 – 4.5	18.0 – 32.5
Engine mounting nut (12 mm)	45 – 70	4.5 – 7.0	32.5 – 50.5
Exhaust pipe bolt	9 – 14	0.9 – 1.4	6.5 – 10.0
Muffler bolt	18 – 28	1.8 – 2.8	13.0 – 20.0
Gear shift lever bolt	13 – 23	1.3 – 2.3	9.5 – 16.5
Secondary drive gear nut	120 – 150	12.0 – 15.0	87.0 – 108.5
Secondary driven gear nut	90 – 110	9.0 – 11.0	65.0 – 79.5
Secondary drive housing bolt	20 – 26	2.0 – 2.6	14.5 – 19.0
Secondary driven housing bolt	20 – 26	2.0 – 2.6	14.5 – 19.0

* Asterisk indicates new D model specification.

CHASSIS

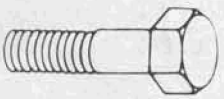
ITEM	N·m	kg-m	lb-ft
Handlebar clamp bolt	12 – 20	1.2 – 2.0	8.5 – 14.5
Steering stem upper clamp bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Front fork upper bracket bolt (R, L)	20 – 30	2.0 – 3.0	14.5 – 21.5
Front fork lower bracket bolt (R, L)	15 – 25	1.5 – 2.5	11.0 – 18.0
Steering stem head bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
Front fork axle holder nut	15 – 25	1.5 – 2.5	11.0 – 18.0
Front fork damper rod bolt	20 – 26	2.0 – 2.6	14.5 – 19.0
Front axle shaft nut	36 – 52	3.6 – 5.2	26.0 – 37.5
Swinging arm pivot bolt	3.5 – 4.5	0.35 – 0.45	2.5 – 3.0
Swinging arm pivot nut	110 – 130	11.0 – 13.0	79.5 – 94.0
Rear torque link nut	20 – 30	2.0 – 3.0	14.5 – 21.5
Rear axle nut	50 – 80	5.0 – 8.0	36.0 – 58.0
Rear shock absorber nut	20 – 30	2.0 – 3.0	14.5 – 21.5
Footrest bolt	27 – 43	2.7 – 4.3	19.5 – 31.0
Front brake caliper mounting bolt	25 – 40	2.5 – 4.0	18.0 – 29.0
Front and rear brake disc plate bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Front brake caliper axle bolt	15 – 20	1.5 – 2.0	11.0 – 14.5
Front brake master cylinder mounting bolt	5 – 8	0.5 – 0.8	3.5 – 6.0
Front and rear brake hose union bolt	13 – 18	1.3 – 1.8	9.5 – 13.0
Front and rear brake oil bleeder bolt	6 – 9	0.6 – 0.9	4.5 – 6.5
Rear brake caliper mounting bolt	20 – 30	2.0 – 3.0	14.5 – 21.5
Rear brake caliper axle bolt	25 – 35	2.5 – 3.5	18.0 – 25.5
Rear brake master cylinder mounting bolt	15 – 25	1.5 – 2.5	11.0 – 18.0
Final drive gear nut	90 – 110	9.0 – 11.0	65.0 – 79.5
Final drive gear housing nut	35 – 45	3.5 – 4.5	25.5 – 32.5
Propeller shaft bolt	30 – 40	3.0 – 4.0	21.5 – 29.0
Final gear bearing case bolt	20 – 26	2.0 – 2.6	14.5 – 19.0
Final gear case shock mount stud bolt	90 – 110	9.0 – 11.0	65.0 – 79.5
Final case oil filler plug	20 – 30	2.0 – 3.0	14.5 – 21.5

TIGHTENING TORQUE CHART

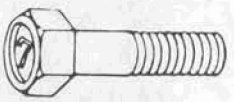
For other bolts and nuts not listed on previous pages, refer to this chart:

TIGHTENING TORQUE

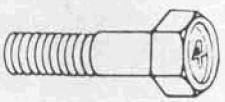
Thread Diameter (mm)	Conventional or "4" Marked Bolt			"7" Marked Bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1 – 2	0.1 – 0.2	0.7 – 1.5	1.5 – 3	0.15 – 0.3	1.0 – 2.0
5	2 – 4	0.2 – 0.4	1.5 – 3.0	3 – 6	0.3 – 0.6	2.0 – 4.5
6	4 – 7	0.4 – 0.7	3.0 – 5.0	8 – 12	0.8 – 1.2	6.0 – 8.5
8	10 – 16	1.0 – 1.6	7.0 – 11.5	18 – 28	1.8 – 2.8	13.0 – 20.0
10	22 – 35	2.2 – 3.5	16.0 – 25.5	40 – 60	4.0 – 6.0	29.0 – 43.5
12	35 – 55	3.5 – 5.5	25.5 – 40.0	70 – 100	7.0 – 10.0	50.5 – 72.5
14	50 – 80	5.0 – 8.0	36.0 – 58.0	110 – 160	11.0 – 16.0	79.5 – 115.5
16	80 – 130	8.0 – 13.0	58.0 – 94.0	170 – 250	17.0 – 25.0	123.0 – 181.0
18	130 – 190	13.0 – 19.0	94.0 – 137.5	200 – 280	20.0 – 28.0	144.5 – 202.5



Conventional Bolt



"7" Marked Bolt



"4" Marked Bolt

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	36 (1.4)	———
	EX.	30 (1.2)	———
Valve lift	IN.	8.0 (0.31)	———
	EX.	7.5 (0.30)	———
Valve clearance or tappet clearance (when cold)	IN. & EX.	0.03–0.08 (0.001–0.003)	———
Valve guide to valve stem clearance	IN.	0.025–0.055 (0.0009–0.0022)	0.35 (0.014)
	EX.	0.040–0.070 (0.0016–0.0028)	0.35 (0.014)
Valve guide I.D.	IN. & EX.	7.000–7.015 (0.2756–0.2762)	———
Valve stem O.D.	IN.	6.960–6.975 (0.2740–0.2746)	———
	EX.	6.945–6.960 (0.2734–0.2740)	———
Valve stem runout	IN. & EX.	———	0.05 (0.002)
Valve head thickness	IN. & EX.	———	0.5 (0.02)
Valve stem end length	IN. & EX.	———	4.4 (0.17)
Valve seat width	IN. & EX.	1.0–1.2 (0.04–0.05)	———
Valve head radial runout	IN. & EX.	———	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	———	33.9 (1.33)
	OUTER	———	41.3 (1.63)
Valve spring tension (IN. & EX.)	INNER	8.9–12.5 kg (19.62–27.56 lbs) at length 31 mm (1.22 in)	———
	OUTER	22.1–27.1 kg (48.72–59.74 bs) at length 35 mm (1.38 in)	———

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.32–36.36 (1.430–1.432)	36.02 (1.418)
	EX.	35.77–35.81 (1.408–1.410)	35.47 (1.397)
Camshaft journal oil clearance	IN. & EX.	0.037–0.065 (0.0015–0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012–22.025 (0.8666–0.8671)	———
Camshaft journal O.D.	IN. & EX.	21.960–21.975 (0.8646–0.8652)	———
Camshaft runout	IN. & EX.	———	0.10 (0.004)
Cam chain 20 pitch length		———	157.80 (6.213)
Cam chain pin (at arrow "3")		20 th pin	———
Cylinder head distortion		———	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	9–12 kg/cm² (128–171 psi)			7 kg/cm² (100 psi)
Compression pressure difference	———			2 kg/cm² (28 psi)
Piston to cylinder clearance	0.050–0.060 (0.0020–0.0024)			0.120 (0.0047)
Cylinder bore	69.000–69.015 (2.7165–2.7171)			69.080 (2.7197)
Piston diam.	68.945–68.960 (2.7144–2.7150) Measure at the 15 (0.59) from skirt end.			68.880 (2.7118)
Cylinder distortion	———			0.20 (0.008)
Piston ring free end gap	1st	N	Approx. 9.0 (0.35)	7.2 (0.28)
	2nd	N	Approx. 11.5 (0.45)	9.2 (0.36)

Piston ring end gap	1st	0.10–0.30 (0.004–0.012)	0.7 (0.03)
	2nd	0.10–0.30 (0.004–0.012)	0.7 (0.03)
Piston ring to groove clearance	1st	———	0.18 (0.0071)
	2nd	———	0.15 (0.0059)
Piston ring groove width	1st	1.21–1.23 (0.047–0.048)	———
	2nd	1.21–1.23 (0.047–0.048)	———
	Oil	2.51–2.53 (0.099–0.100)	———
Piston ring thickness	1st	1.175–1.190 (0.0463–0.0469)	———
	2nd	1.170–1.190 (0.0461–0.0469)	———
Piston pin bore I.D.		16.002–16.008 (0.6300–0.6302)	16.030 (0.6311)
Piston pin O.D.		15.995–16.000 (0.6297–0.6300)	15.980 (0.6291)

CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.006–16.014 (0.6302–0.6305)	16.040 (0.6315)
Conrod deflection	———	3.0 (0.12)
Conrod big end side clearance	0.10–0.65 (0.004–0.026)	1.0 (0.039)
Crankshaft runout	———	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	———
Oil pressure (at 60°C, 140°F)	Above 0.1 kg/cm² (1.4 psi) Below 0.25 kg/cm² (3.6 psi) at 3000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2–3 (0.08–0.12)	———
Drive plate thickness	2.7–2.9 (0.106–0.114)	2.4 (0.094)
Drive plate claw width	11.8–12.0 (0.46–0.47)	11.0 (0.43)
Driven plate thickness	2.0 ± 0.06 (0.08 ± 0.002)	———
Driven plate distortion	———	0.1 (0.004)
Clutch spring free length	———	38.4 (1.51)

TRANSMISSION

Unit: mm (in) Except ratio

ITEM	STANDARD		LIMIT
Primary reduction ratio	1.775 (87/49)		———
Secondary reduction ratio	1.062 (17/16)		———
Final reduction ratio	3.090 (34/11)		———
Gear ratios	Low	2.500 (35/14)	———
	2nd	1.722 (31/18)	———
	3rd	1.380 (29/21)	———
	4th	1.125 (27/24)	———
	Top	0.923 (24/26)	———
Shift fork to groove clearance	0.4—0.6 (0.016—0.024)		0.8 (0.031)
Shift fork groove width	5.45—5.55 (0.215—0.219)		———
Shift fork thickness	4.95—5.05 (0.195—0.199)		———

SHAFT DRIVE

Unit: mm (in)

ITEM	STANDARD	LIMIT
Secondary bevel gear backlash	0.08—0.13 (0.003—0.005)	———
Final bevel gear backlash	0.03—0.64 (0.001—0.025)	———
Secondary drive bevel gear preload	3—5 kg-cm (2.60—4.35 lb-in)	———
Secondary driven bevel gear preload	4—7 kg-cm (3.45—6.05 lb-in)	———
Final drive bevel gear preload	4—8 kg-cm (3.45—6.95 lb-in)	———

CARBURETOR

Unit: mm (in)

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS32SS
Bore size		32 (1.26)
I.D. No.		45160
Idle r/min		1 050 ± 100 r/min
Fuel level		5.0 ± 0.5 (0.20 ± 0.02)
Float height		22.4 ± 1.0 (0.88 ± 0.04)
Main jet	(M.J.)	# 115
Main air jet	(M.A.J.)	1.7
Jet needle	(J.N.)	5D50
Needle jet	(N.J.)	X-5
Pilot jet	(P.J.)	# 40
By pass	(B.P.)	1.0, 0.8, 0.8
Pilot outlet	(P.O.)	0.7
Valve seat	(V.S.)	2.0
starter jet	(G.S.)	# 32.5
Pilot screw	(P.S.)	PRE-SET
Pilot air jet	(P.A.J.)	# 180
Throttle cable play		0.5 – 1.0 (0.02 – 0.04)

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		NOTE
Ignition timing	17° B.T.D.C. Below 1500 ± 150 r/min and 37° B.T.D.C. Above 2350 ± 150 r/min.		
Firing order	1, 2, 4, 3		
Spark plug	Type	NGK: B8ES N.D.: W24ES-U	
	Gap	0.6–0.8 (0.024–0.031)	
Spark performance	Over 8 (0.3) at 1 atm.		
Signal coil resistance	* 140 – 180 Ω		Bl – Y, G – B
Ignition coil resistance	Primary	* ⊕ tap – ⊖ tap 3–5 Ω	
	Secondary	Plug cap–Plug cap 30 – 40 kΩ	
Generator no-load voltage	More than 80 V (AC) at 5000 r/min.		
Regulated voltage	14.0–15.5 V at 5000 r/min.		
Starter motor	Brush length	Limit: 6 (0.24)	
	Commutator under cut	Limit: 0.2 (0.008)	
Starter relay resistance	3–4 Ω		
Battery	Type designation	YB14L–A2	
	Capacity	12V 50.4kC (14Ah)/10HR	
	Standard electrolyte S. G.	1.28 at 20°C (68°F)	
Fuse size	Headlight	10 A	
	Turn signal	10 A	
	Ignition	10 A	
	Main	15 A	
	Output terminal	10 A	

* Asterisk indicates new D model specifications.

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		15 (0.6)	———
Brake disc thickness	Front	5.0 ± 0.2 (0.2 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		———	0.30 (0.012)
Master cylinder bore	Front	15.870–15.913 (0.6248–0.6265)	———
	Rear	14.000–14.043 (0.5512–0.5529)	———
Master cylinder piston diam.	Front	15.827–15.854 (0.6231–0.6242)	———
	Rear	13.957–13.984 (0.5495–0.5506)	———
Brake caliper cylinder bore	Front	38.180–38.256 (1.5031–1.5061)	———
	Rear	38.180–38.256 (1.5031–1.5061)	———
Brake caliper piston diam.	Front	38.098–38.148 (1.4999–1.5019)	———
	Rear	38.098–38.148 (1.4999–1.5019)	———
Wheel rim runout	Axial	———	2.0 (0.08)
	Radial	———	2.0 (0.08)
Wheel axle runout	Front	———	0.25 (0.010)
	Rear	———	0.25 (0.010)
Tire size	Front	100/90-19 57H (Tubeless tire)	———
	Rear	130/90-16 67H (Tubeless tire)	———
Tire tread depth	Front	———	1.6 (0.06)
	Rear	———	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	160 (6.3)	———	
Front fork spring free length	———	516 (20.3)	
Front fork oil level	260 (10.2)	———	
Front fork air pressure	0.8 kg/cm² (11.4 psi)	———	
Rear wheel travel	100 (3.9)	———	

FUEL + OIL

ITEM		SPECIFICATION	NOTE
Fuel type		Use only unleaded or low-lead type gasoline of at least 85 - 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve		17 L (4.5/3.7 US/Imp gal)	
reserve		4.5 L (4.8/4.0 US/Imp qt)	
Engine oil type		SAE 10W/40	
Engine oil capacity	Change	3000 ml (3.2/2.6 US/Imp qt)	
	Filter change	3600 ml (3.8/3.2 US/Imp qt)	
	Overhaul	3800 ml (4.0/3.3 US/Imp qt)	
Front fork oil type		Fork oil # 15	
Front fork oil capacity (each leg)		245 ml (8.28/8.63 US/Imp oz)	
Bevel gear oil type		Hypoid Gear oil SAE 90, API grade GL-5	
Bevel gear oil capacity	Secondary	340—400 ml (11.5/12.0—13.5/14.1 US/Imp oz)	
	Final	280—330 ml (9.5/9.9— 11.2/11.6 US/Imp oz)	
Brake fluid type		DOT3 or DOT4	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	175	1.75	24	175	1.75	24	200	2.00	28	225	2.25	32
REAR	200	2.00	28	250	2.50	36	225	2.25	32	280	2.80	40

WATTAGE

Unit: W (cp)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
Running/Front turn signal light		8/23(3/32)
Rear signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Fuelmeter light		1.7
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
Side stand check light		3.4

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EMISSION CONTROL & REGULATIONS

CONTENTS

REGULATION 10- 2
EMISSION CONTROL CARBURETOR COMPONENTS. 10- 3
GENERAL EMISSION INFORMATION. 10- 4

EMISSION CONTROL AND REGULATIONS

REGULATION

On February 4, 1977 Federal Emission Regulations for motorcycles took affect. All motorcycles produced after January 1, 1978 must meet specific emission limits. This act establishes three categories of motorcycles and an emission level for each category. The categories are as follows:

50 cc—170 cc
171 cc—749 cc
750 cc—Larger

The emission limits for motorcycles produced during 1978 and 1979 are as follows:

1978-1979 EMISSION LIMITS

Categories	Hydrocarbons (HC)	Carbon Monoxide (CO)
50 cc—170 cc	5.0 Grams/Kilometer (8.0 Grams/Mile)	17 Grams/Kilometer (27.4 Grams/Mile)
171 cc—749cc	*5.0—14.0 Grams/Kilometer (8.0—22.5 Grams/Mile)	17 Grams/Kilometer (27.4 Grams/Mile)
750 cc—Larger	14.0 Grams/Kilometer (22.5 Grams/Mile)	17 Grams/Kilometer (27.4 Grams/Mile)

* Dependent upon displacement.

The emission limits for 1980 are more restrictive than the previous two model years. These limits are as follows:

1980 EMISSION LIMITS

Categories	Hydrocarbons (HC)	Carbon Monoxide (CO)
All motorcycles 50 cc—Larger	5.0 Grams/Kilometer (8.0 Grams/Mile)	12 Grams/Kilometer (19.3 Grams/Mile)

This regulation affects all motorcycles licensable for highway operation. This definition of highway-approved motorcycles covers motorcycles equipped with a headlight, taillight and stop light and which have an engine displacement larger than 50 cc.

All testing and certification of emission-controlled motorcycles will be performed by Suzuki Motor Company in compliance with the E.P.A. testing regulations. Motorcycle dealers are not required to certify emission levels on any motorcycle.

This regulation provides for fines of up to $10,000 per motorcycle for individuals who alter, render inoperative or improperly service emission-controlled motorcycles. It is essential that the individual servicing this emission-controlled motorcycle review thoroughly the correct service procedures discussed in this manual. Under no circumstances should the service procedures be deviated from nor adjustments made which are not in accordance with the factory specifications.

EMISSION CONTROL CARBURETOR COMPONENTS

The GS850G is an emission control type model as it was introduced after January 1, 1978. This model utilizes a specially manufactured carburetor to limit emissions. Emission type carburetors require different components and other special adjustments if they are to perform properly.
There are seven (7) carburetor mixture control components in each carburetor assembly. Three (3) of these components are machined to much closer tolerances than standard carburetor jets. These three (3) jets, MAIN JET, NEEDLE JET, PILOT JET, must not be replaced by standard jets. To aid identification of these three (3) jets a different style letter and number are used. If replacement of these close tolerance jets becomes necessary, be sure to replace them with the same type of close tolerance jet marked in the same manner as the examples shown below.

Conventional Figures Used On Standard Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0
Emission Type Figures Used On Close tolerance Jet Components	1 2 3 4 5 6 7 8 9 0

The throttle Slide and the Jet Needles are not special tolerance components. Either of these two parts may be replaced by standard tolerance parts provided that they are the same size. The carburetor specifications for the emission-controlled GS850G are as follows.

Carburetor I.D.No.	Main Jet	Needle Jet	Jet Needle	Cut Away	Pilot Jet	Air Screw	Pilot Screw
45100	#102.5	0—4	5DL36—2	1.5	#15	PRE-SET	PRE-SET
						DO NOT ADJUST	

DO NOT ADJUST THE AIR SCREW AND PILOT SCREW. Adjusting, interfering with, replacing, or resetting of either of these adjustable metering components may affect the carburetor performance adversely and cause the machine to exceed the emission levels. Tampering with either of these two adjustments may also subject the person to fines under the federal emission regulations and also the state regulations regarding tampering. The air screw and pilot screw are pre-set by the factory using specialized testing and adjusting procedures. It is not possible to duplicate these adjustments. If persons, who are unaware of these special adjustments or the anti-tampering laws, have tampered with the carburetor adjustments the Suzuki dealer should contact the disributor's representative for further technical information and assistance.

GENERAL EMISSION INFORMATION

There are three different types of emissions. They are:

Hydrocarbons (HC)
Carbon Monoxide (CO)
Oxides of Nitrogen (NOx)

Automobiles must meet specific emission standards for all three of these pollutants. Motorcycles must only meet the requirements for the following:

Hydrocarbons (HC)
Carbon Monoxide (CO)

HC exhaust emissions are basically unburned fuel vapors which have passed through the engine and escaped the combustion process.

CO exhaust emissions are formed during an incomplete combustion cycle as a result of a rich air fuel mixture. The only way that CO can be produced is by the combustion cycle.

Total NOx emissions from all motorcycles is considered negligible. The EPA states that total NOx emission from motorcycles by 1990 will only amount to approximately 0.5%. NOx is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

Carbon monoxide is a product of an incomplete combustion cycle. CO is measured in grams per mile or kilometer and also in percentage (%)

The most common cause of CO is rich carburetion. As the mixture is richened excessively, the CO amount increases proportionately. Engine oil is also a hydrocarbon, so engine problems which lead to oil burning increase carbon monoxide.

CARBURETION MALFUNCTION

1. Air Cleaner—Dirty or over oiled.
2. Idle Mixture—Adjusted incorrectly.
3. Idle Speed—Too high or low.
4. Fuel Level—Sticking float, leaking needle, incorrect setting.
5. Choke—leaking or linkage sticking.
6. Synchronization—Improper balance of multi cylinders.

ENGINE MALFUNCTIONS

1. Valve Seals—Leaking or torn.
2. Valve Guide—Worn and leaking excessive oil.
3. Gaskets—Leaking oil into combustion chamber.

HYDROCARBONS

Hydrocarbons are unburnt gasoline vapors and can be measured in two differenct ways. The first is to measure the weight of the pollutants over a specific distance such as grams per mile or grams per kilometer. The second method is to measure the concentration of HC in the exhaust gas in parts per million (PPM).

The most common cause of high HC emissions are ignition system problems. If the ignition system fails to ignite the fuel mixture properly, then raw gasoline vapors will pass through the engine into the exhaust system. Listed are the most common ignition problems which occur and which can affect HC emission output.

IGNITION SYSTEM MALFUNCTIONS

1. Spark plugs—Fouled, dirty, improper type or improperly gapped.
2. Contact Points—improperly adjusted, pitted, worn or sticking.
3. Ignition Timing—Advanced or Retarded.
4. Timing advance—Too fast or too slow an advance rate.
5. Battery—Low charge or faulty.

Carburetion can also lead to high HC emissions if the mixture is either excessively rich or excessively lean.

MIXTURE-RELATED MALFUNCTIONS

1. Air Cleaner—Dirty, over oiled or torn.
2. Jets—Clogged, constricted or incorrect size.
3. Float Level—Level too low (lean) or too high (rich).
4. Choke—Leaking choke plunger or sticking linkage.
5. Air Leaks—Intake manifolds, engine gaskets and other sealing surfaces.
6. Synchronization—Unbalanced on multi-cylinder machines.
7. Exhaust System—Restricted flow or improper exhaust system.

Engine wear or damage can also cause high HC emission.

1. Rings—Low compression, leakage into crankcase.
2. Valves—Improper adjustment, bent stem or burnt.
3. Gaskets—Leaking, loss of compression.
4. Crank seals—Leaking.
5. Oil Consumption—Worn valve guides, worn rings, clogged crankcase breather.
6. Oil—Improper engine oil.

CHASSIS

CONTENTS

HANDLEBARS 11- 2
CLUTCH CABLE 11- 3
THROTTLE CABLE 11- 3
CHOKE CABLE 11- 5
SPEEDOMETER CABLE 11- 5
TACHOMETER CABLE 11- 5
SPEEDOMETER AND TACHOMETER 11- 6
HEADLIGHT 11- 6
IGNITION SWITCH 11- 7
FRONT FORK 11- 9
STEERING STEM 11-15
STEERING STEM BEARING 11-19
FRONT WHEEL 11-20
REMOVAL OF TUBE AND TIRE 11-24
FRONT BRAKE MASTER CYLINDER 11-25
FRONT BRAKE CALIPER 11-29
CALIPER 11-30
REAR BRAKE CALIPER 11-32
REAR MASTER CYLINDER 11-35
REAR WHEEL 11-38
REAR SWINGING ARM 11-43
REAR SHOCK ABSORBER 11-45

HANDLEBARS

REMOVAL

- Remove the left and right rear view mirrors.
- Shift the clutch cover boot towards the cable side.
- Loosen lock nut ① of clutch lever portion to fully tighten adjuster ②.
- Align the grooves of the adjuster and lock nut with that of the clutch lever to remove clutch cable from the clutch lever.

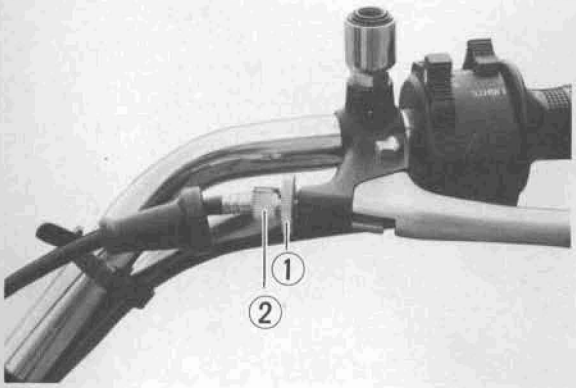


Fig. 11-1

- Remove vinyl bands from the left and right of the handlebars.
- Remove screws for mounting the left handlebars switch to separate the upper and lower portions of the switch.
- Remove screws for mounting the right handlebars switch to separate the upper and lower portions of the switch.
- Remove the master cylinder clamp bolts.
- Remove the four screws, two each on both right and left sides, and remove the handlebars pad.

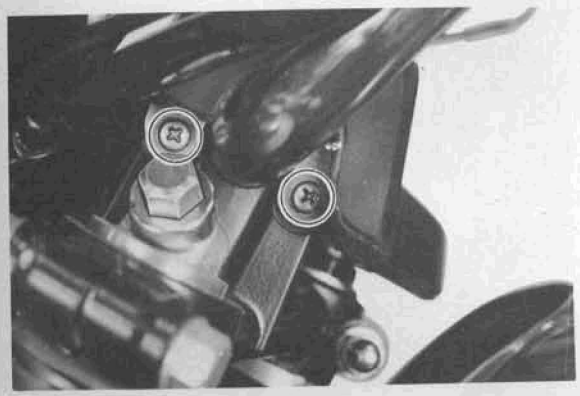


Fig. 11-2

- Remove throttle grip and throttle wire together from the handlebars.
- Remove the handlebars clamping bolts and remove handle holders.

Fig. 11-3

- To remove the clutch lever from the handle bar, take off the handle grip before loosening the clutch lever bolts.

MOUNTING

- Pass both the throttle grip and the throttle wire through the handlebars from the right side.
  Align punch mark on the handlebars with the upper end of the steering upper bracket and mount the handlebars. At this time the front and rear holder bolts must be tightened with the same clearance ③.

Handle holder bolts tightening torque:	1.2—2.0 kg-m (8.5—14.5 lb-ft)

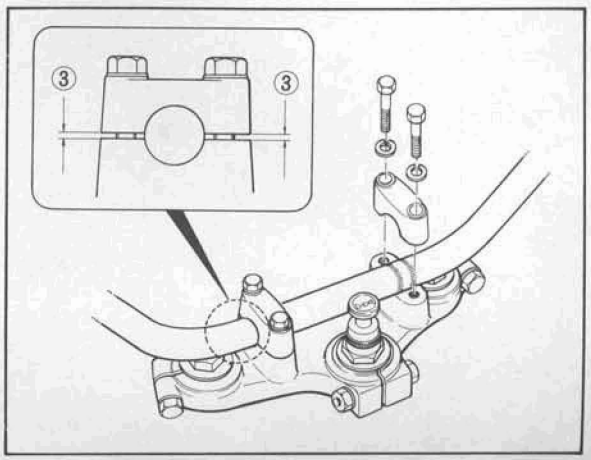


Fig. 11-4

- Mount the right and left handlebars switches securely on the handlebars fastening them with the screws.
- Mount the master cylinder securely on the handlebars. (see page 11-26)
- Fix the lead wire from the left and right switch or the handlebars with a vinyl band.
- Mount the left and right rear view mirrors.
- Adjust the clutch play. (See page 3-13)

CLUTCH CABLE

REMOVAL

- Remove the fuel tank.
- See Fig. 11-1 for removal procedure of the clutch cable on the handlebars side.
- Remove cam lever bolt ① on the clutch side, loosen the adjuster lock nut and remove the adjuster.
- Remove the clutch cable from the motorcycle frame.

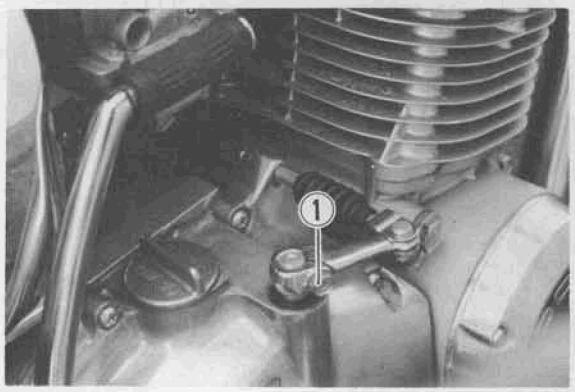


Fig. 11-5

MOUNTING

- Route the clutch cable between carburetors Nos. 1 and 2. Next, as shown in the drawing below, route it along the upper left portion of the ignition coil below the upper steering bracket to the left side of the ignition switch through the tachometer-speedometer mounting brackets.

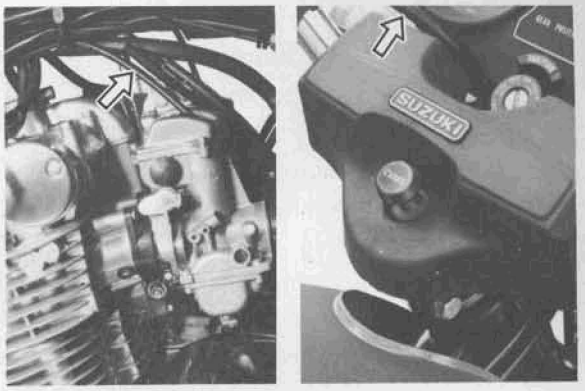


Fig. 11-6

- Mount the clutch cable on the clutch lever.
- Mount adjuster bolts on the clutch cover side and fasten the cam lever with the cam lever bolts.
- Adjust the clutch lever play (see page 3-13).

THROTTLE CABLE

REMOVAL

- Remove the fuel tank.
- Loosen the lock nuts on both cables on the throttle grip portion and firmly tighten both cable adjusting nuts to provide sufficient cable play.
- Remove cable adjusters ① from the bracket at the opening and closing ports on the carburetor side and remove the inner cable from the lever.

Fig. 11-7

- A clamp fixing the throttle wire is located in front of the ignition coil. Draw out the throttle wire over the bent clamp.
- Remove the right handlebars switch screws and separate the upper and lower portions of the handle switch.
- Screw back cable adjusting nut ① at the closing side and remove it from the throttle cable guide. Loosen the cable guide lock nut and remove cable guide ② from the handlebars switch.

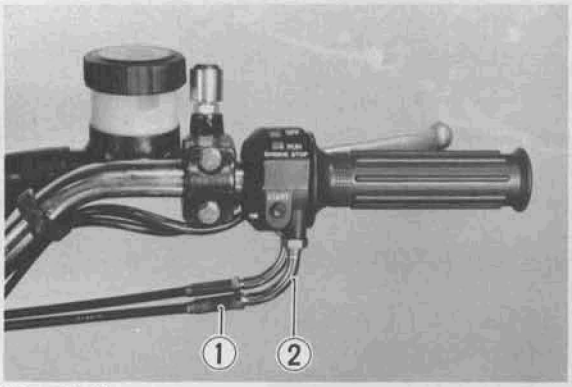


Fig. 11-8

- Remove throttle inner cable ① at the closing side from the throttle grip and remove the cable.
- Loosen the cable guide lock nut at the opening side and remove the cable guide from the handlebars switch.
- Remove throttle inner cable ② at the opening side from the throttle grip and remove the cable.

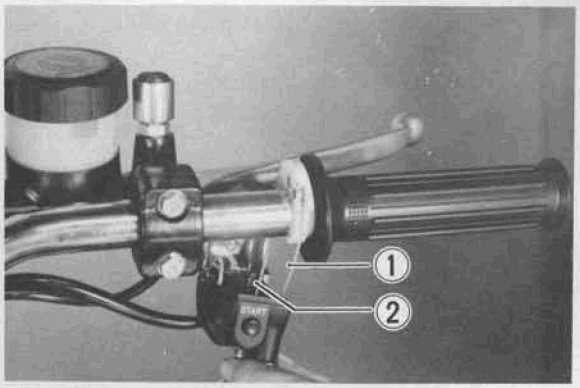


Fig. 11-9

MOUNTING

- Mount throttle cable guide ① at the opening side and throttle cable guide ② at the closing side on the handlebars switch and lightly tighten the lock nuts.

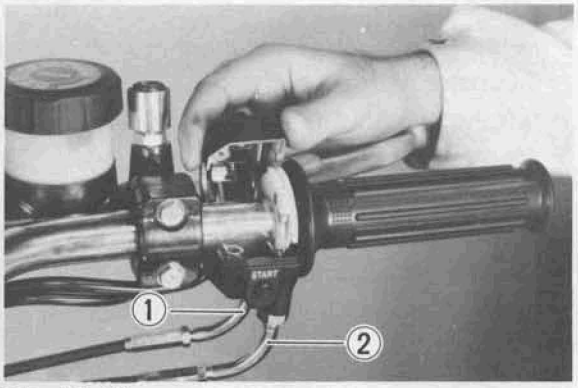


Fig. 11-10

- Mount the throttle inner cables at the opening and closing sides respectively on the front and rear holes in the throttle grip.
- Fix the right handlebar switch on the handlebar.
- Route both cables through the space between the tachometer and ignition switch and then between the steering head pipe and the right front fork.
- Fix the throttle wire with the clamp on the front of the igniton coil.

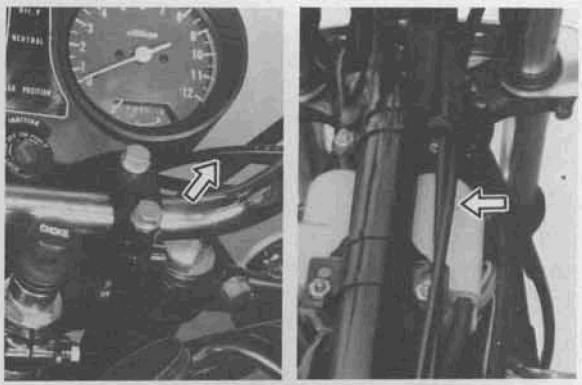


Fig. 11-11

- Mount the inner cable at the opening side on the lever at the rear side. Mount the cable adjuster on the bracket and fix it with the upper and lower nuts.
- Mount the inner cable at the closing side on the lever at the front side. Mount the cable adjuster on the bracket and fix it with the upper and lower nuts.
  If it is difficult to mount the inner cable on the lever, turn the throttle grip to the full open position and then mount the inner cable.
- Adjust the throttle cable (see page 3-13).
- Mount the fuel tank.

CHOKE CABLE

REMOVAL

- Remove the fuel tank.
- Loosen the lock nut on the carburetor side and remove both inner and outer cables from the carburetor. (See page 9-6.)
- Remove the handlebars pad. (See page 11-2.)
- Loosen the choke knob lock nut ① , turn the choke knob counterclockwise, remove the choke knob from the steering head pipe, and remove the choke cable.
- Release the clamp holding the starter cable at the rear of the ignition coil.

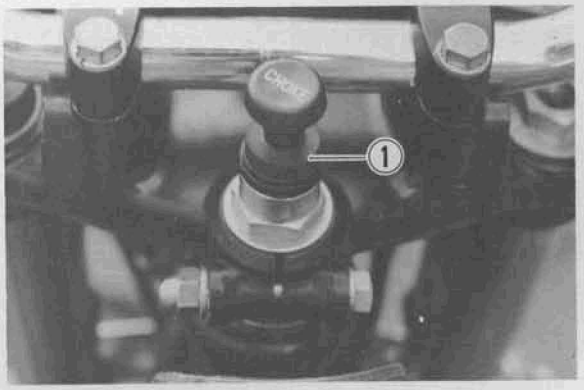


Fig. 11-12

INSTALLATION

- Pass the choke cable through the head pipe and route it under the ignition coil.

> *NOTE:*
> *The choke cable should be threaded through the wire harness, not through the clamp.*

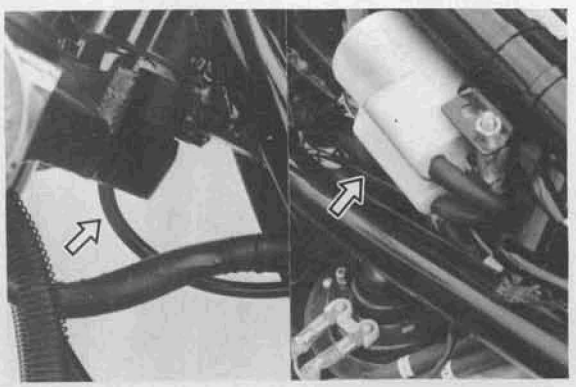


Fig. 11-13

- Install the cable adjuster on the bracket and install the inner cable. Adjust for 0.5–1.0 mm (0.02–0.04 in) free play. Secure the cable adjuster with the locknut.
- Install the starter knob on the steering head pipe and secure the knob with the locknut.
- Install the handlebars pad.
- Mount the fuel tank.

SPEEDOMETER CABLE

REMOVAL

- Remove both ends of the speedometer cable with pliers and remove the cable from the speedometer gear housing and speedometer from the front hub.

MOUNTING

- Route the speedometer cable to the brake oil hose joint portion and through the cable guide. Mount the cable nut of the upper end on the speedometer and tighten it with pliers.
- Route the cable in between the lower triple clamp and the front fork cover.
- Mount the lower end of the cable on the speedometer gear housing. Then rotate the wheel so that the groove at the end of the inner cable meshes with the projection of the speedometer pinion and tighten the cable nut.

TACHOMETER CABLE

REMOVAL

- Remove the tachometer cable from the tachometer side and the cylinder head side with pliers.

MOUNTING

- Route the tachometer cable from the rear portion of the tachometer between the steering head pipe and right front fork and mount it on the cylinder head cover.
  At this time make sure that the inner cable engages the tachometer gear, and tighten the cable nut.

SPEEDOMETER AND TACHOMETER

REMOVAL

- Remove the two instrument bracket retaining bolts.
- Remove the fuel tank.
- Remove the headlight.
- Remove connection coupler connected to the main wire harness on the lower portion of tank for the meter lead wire over the fixed clamp.

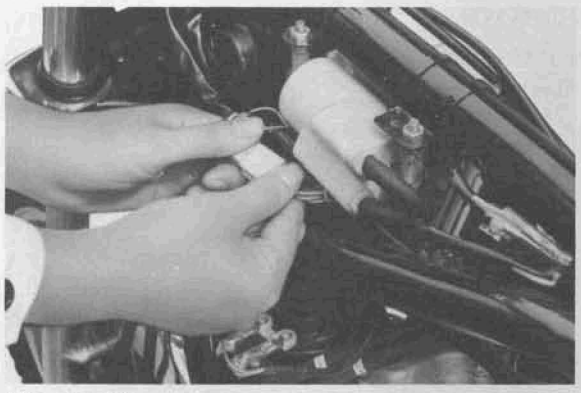


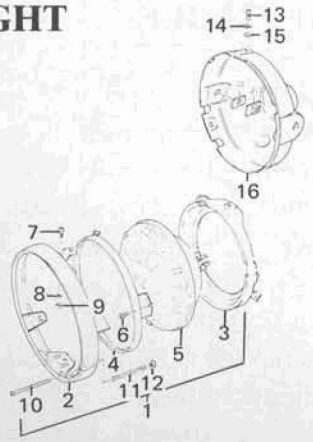
Fig. 11-14

MOUNTING

- Route the lead wire of the meter between the steering head pipe and the right front fork and clamp it to the fixed clamp on the frame side.
- Fasten the meter with two bolts. Fasten the right side of the meter together with the brake hose guide.
- Mount the speedometer and the tachometer.
- Mount the headlight.
- Mount the fuel tank.

HEADLIGHT

REMOVAL



1. Headlight ass'y
2. Rim
3. Mounting ring
4. Ring
5. Unit
6. Screw
7. Screw
8. Lock washer
9. Nut
10. Adjuster screw
11. Spring
12. Nut
13. Screw
14. Lock washer
15. Spacer
16. Headlight housing

Fig. 11-15

- Remove three screws ⑬ securing the headlight.
- Disconnect the headlight lead coupler.
- Remove adjusting screw ⑩ .
- Remove two screws ⑦ and remove the rim.
- Remove three screws ⑥ and remove the headlight unit.

CAUTION

* *When installing the adjusting screw, insert a washer between the spring and bracket.*
* *When mounting the headlight unit the word "TOP" must face upwards.*
* *After completion of work, adjust the horizontal and vertical angles of the headlight beam.*

ADJUSTMENT OF HORIZONTAL ANGLE

- Turn adjusting screw ① on the headlight rim to change the direction of the beam. Turning the screw clockwise directs the beam to left and turning the screw counterclockwise directs the beam to the right.

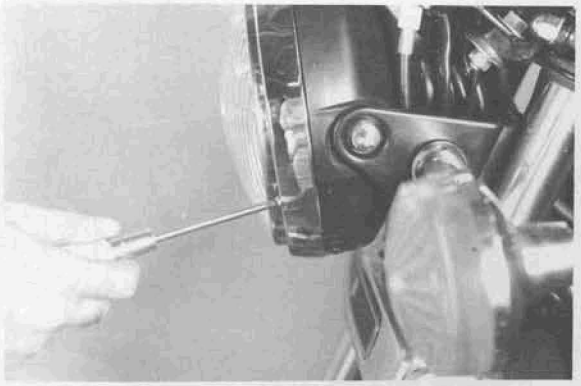


Fig. 11-16

ADJUSTMENT OF VERTICAL ANGLE

- Loosen the left and right housing bolts.
- Manually adjust the vertical beam angle of the headlight and tighten the right and left mounting bolts.

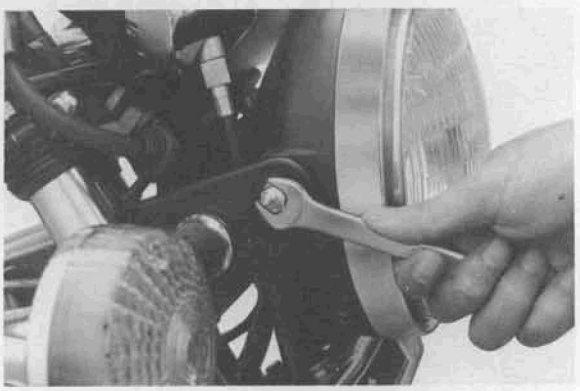


Fig. 11-17

IGNITION SWITCH

REMOVAL

- Remove the headlight and then each lead wire connected within the headlight housing.
- Remove the two headlight housing bolts and remove the housing.
- Remove the two screws that hold the ignition switch with a 5 mm Allen wrench and remove the ignition switch.

5 mm "L" type hexagon wrench	09911-70110

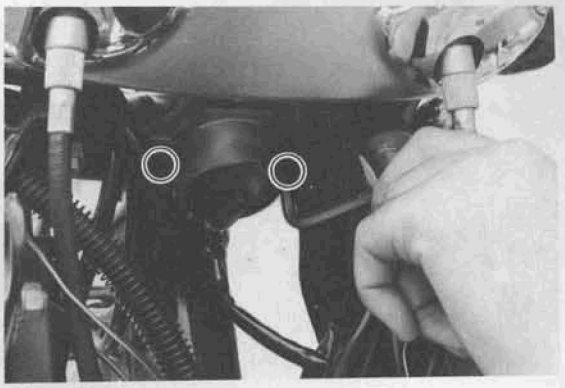


Fig. 11-18

MOUNTING

- Mount parts in the reverse order to removal.
- Route the lead wires of the ignition switch, left handlebars switch, front brake switch and turn signal light through the lower hole in the headlight housing and fasten the housing with two bolts.
- Connect each lead wire.
  Connect the lead wire of the ignition switch to coupler ① on the wire harness side. Connect the lead wire of the right handlebars switch to coupler ② on the wire harness side.
  The orange and white lead wires of the front brake switch are to be connected respectively to the orange and white ones on the wire harness side.
  The black/white lead wires of the left and right ground wire for the front turn signal are to be connected respectively to the black/white ones on the wire harness side.
  Also connect the black lead wire of the left turn signal body to the black one on the wire harness, and connect the right side lead wire to the light green one on the wire harness side.
- Connection of headlight. Connect connection coupler ③ of the headlight to the headlight connection.

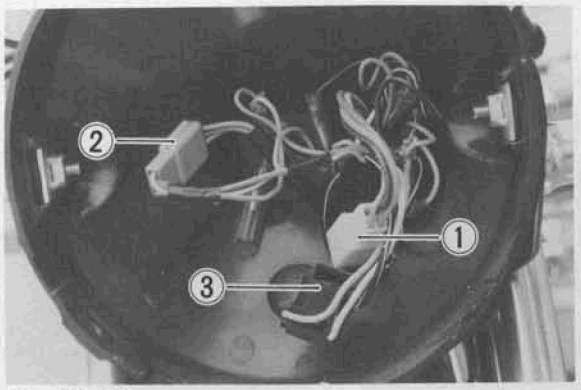
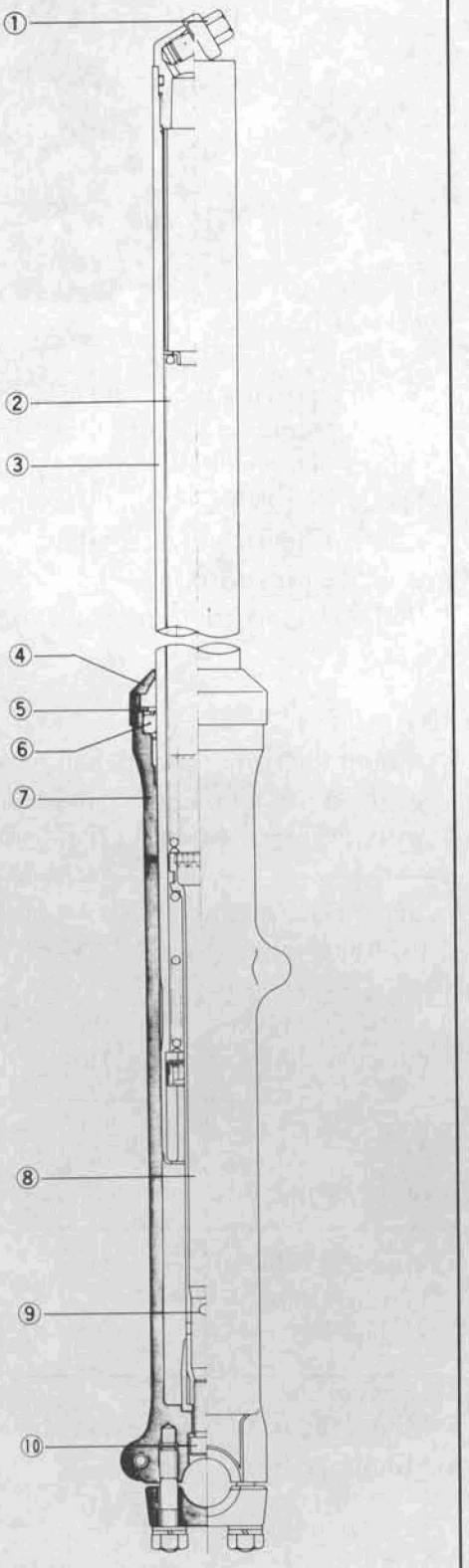


Fig. 11-19

- Secure the headlight with the three screws. Adjust the vertical beam angle of the headlight (see page 11-7).

FRONT FORK



1. Air valve cap
2. Spring
3. Inner tube
4. Dust seal
5. Oil seal stopper ring
6. Oil seal
7. Outer tube
8. Seat pipe
9. Oil lock piece
10. Bolt

Fig. 11-20

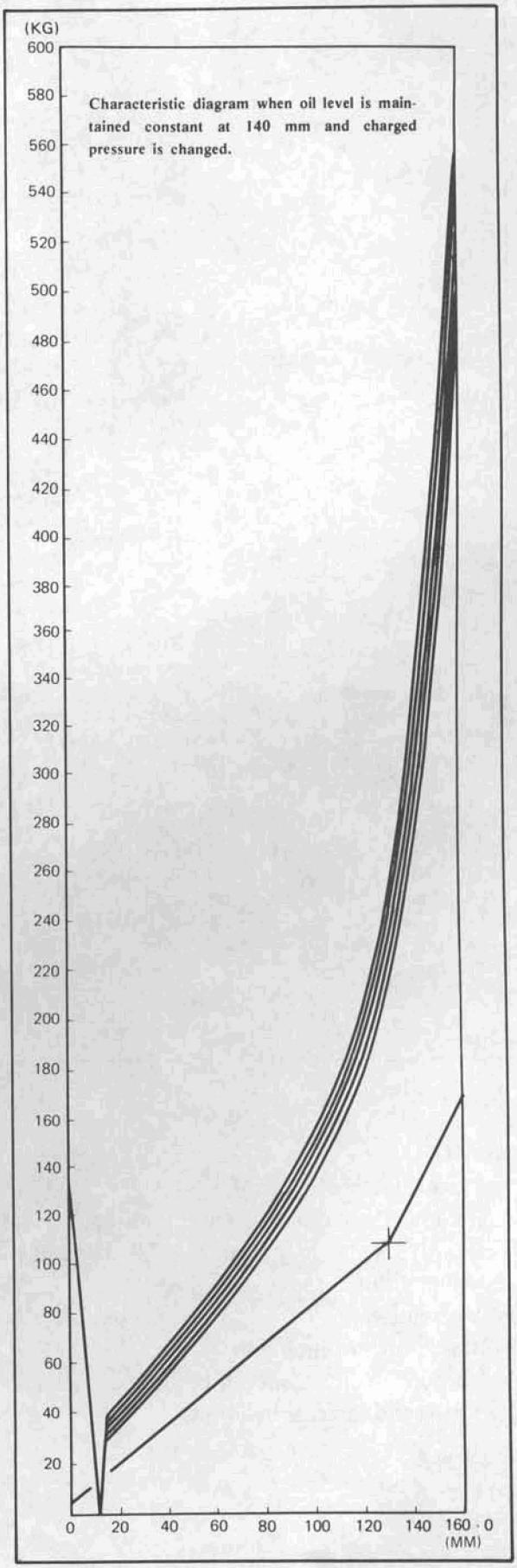
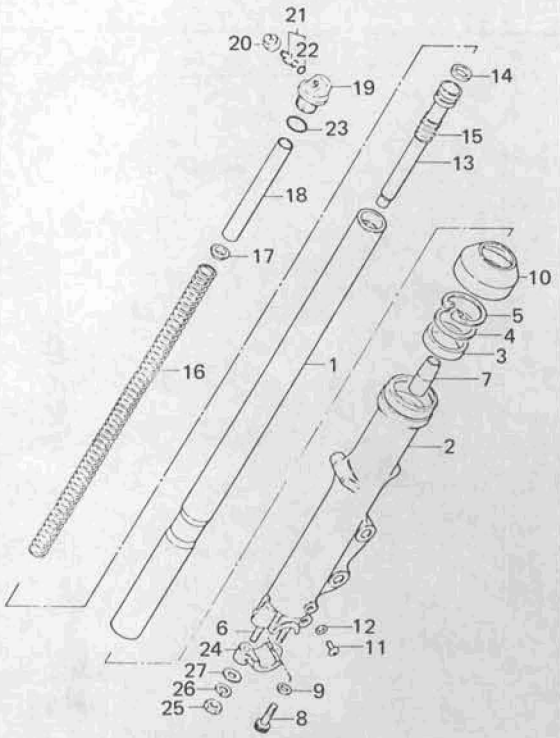


Fig. 11-21



1. Inner tube
2. Outer tube
3. Oil seal
4. Washer
5. Oil seal stopper ring
6. Stud bolt
7. Oil lock piece
8. Bolt
9. Gasket
10. Dust seal
11. Screw
12. Gasket
13. Damper rod
14. Damper rod ring
15. Rebound spring
16. Spring
17. Spring guide
18. Spacer
19. Upper cap
20. Valve cap
21. Valve
22. O ring
23. O ring
24. Axle holder
25. Nut
26. Lock washer
27. Washer

Fig. 11-22

REMOVAL

- Place a jack below engine.
- Remove the front wheel and front fender.
- Remove valve cap ① and hold the valve with a pointed tool to bleed air.
- To remove the fork, it is preferable to loosen upper pinch bolt ②.
- Loosen front fork tube upper pinch bolt ③ and lower pinch bolt ④.

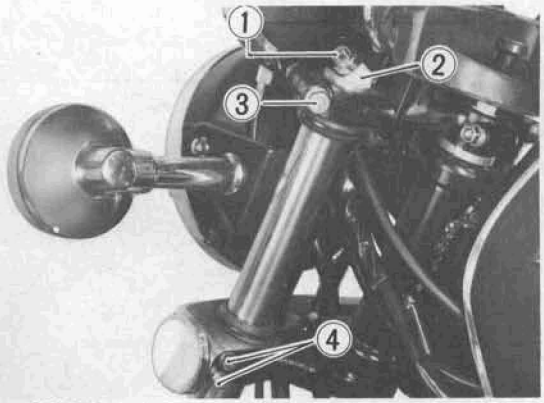


Fig. 11-23

- When removing the front fork, remove the caliper mounting bolts and remove the right and left calipers.
  Hang the caliper from the motorcycle frame using string, etc., taking care not to bend the brake hoses.
- Pull down the front fork while rotating it.

MOUNTING

- Mount the front fork so that the upper end of the inner tube in the front fork is flush with the upper surface of the stem head.

Upper pinch bolt tightening torque	2.0—3.0 kg-m (14.5—21.5 lb-ft)
Lower pinch bolt tightening torque	1.5—2.5 kg-m (11.0—18.0 lb-ft)

- Mount the caliper. The tightening torque of the caliper mounting bolt is as follows:

Caliper mounting bolt tightening torque	2.5—4.0 kg-m (18.0—29.0 lb-ft)

- Mount the front fender on the front fork.
- Mount the front wheel.

CAUTION:
- *Fasten the speedometer gear box at the position shown in the drawing below and take care not to bend the speedometer cable excessively.*
- *When securing the front axle holders, check that the clearances, front and back, on each holder are equal. To make sure that the two legs, right and left, are parallel, check as follows. Fasten the two axle holders temporarily and loosen the four front fender mounting bolts; under this condition, move the fork up and down several times to make the two legs parallel. Tighten the bolts on the axle holders and fender fully after checking in this manner.*

Tightening torque of front axle holder nut	1.5—2.5 kg-m (11.0—18.0 lb-ft)

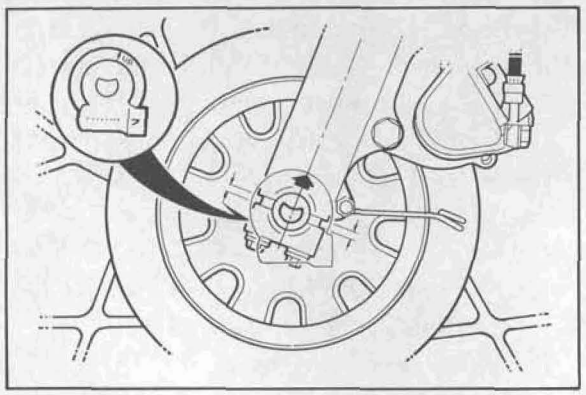


Fig. 11-24

DISASSEMBLY OF FRONT FORK
- Remove the upper cap bolt and the fork spring.
- Expand and compress the front fork to drain oil.
- Remove dust rail.
- Remove Allen bolt mounted on the lower portion of the front fork using the special tool ①. At this time firmly secure the cylinder using special tool ②; so that the cylinder does not rotate.

8 mm hexagon wrench	09911-71510

Front fork assembling tool "T" handle	09940-34520
Front fork assembling tool attachment "D"	09940-34651

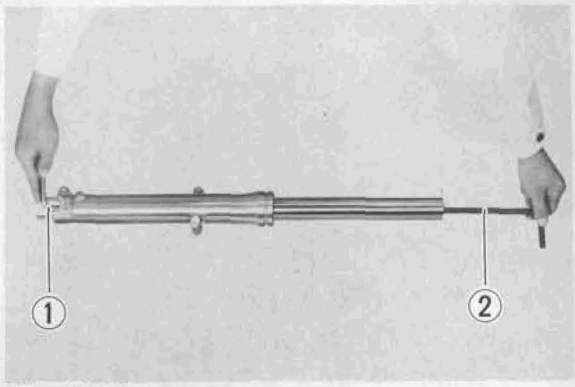


Fig. 11-25
- Remove the inner tube from the outer tube.
- Remove the cylinder unit from the inner tube.
- To remove the oil seal from the outer tube, remove the oil seal stopper ring and the washer. When removing oil seal stopper ring, use special tool ③.

Snap ring pliers	09900-06105

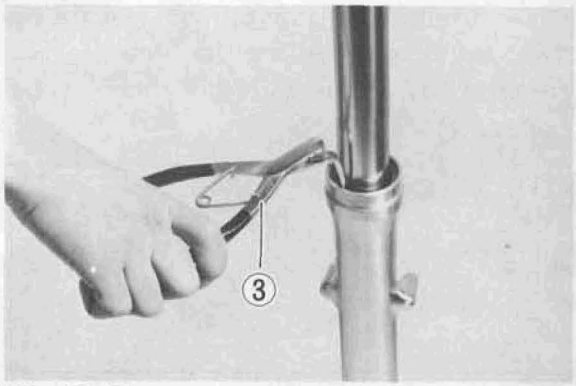


Fig. 11-26
- Remove the oil seal, using special tool ④if necessary. If, after two or three impacts with the hammer the seal does not start to move, rotate the remover 90°, retighten and strike again.

NOTE:
When using the oil seal remover, use the sliding hammer with it.

Front fork oil seal remover	09941-64510

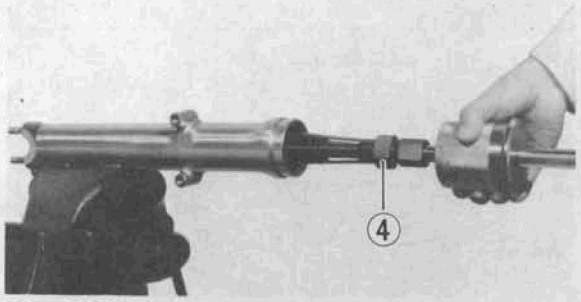


Fig. 11-27

ASSEMBLY

- Insert the cylinder unit into the inner tube. Apply screw lock (99000-32040) to the Allen bolt and firmly secure the cylinder so that it does not rotate with the front fork assembling tool "T" handle and front fork assembling tool attachment "D", and tighten the Allen bolt.

Allen bolt Tightening torque	2.0–2.6 kg-m (14.5–19.0 lb-ft)

- After removing the oil seal replace it with a new one mounting it on the outer tube using special tools, i.e. ① and ② after applying oil to the outer periphery of the oil seal.

①	Front fork oil seal installing tool driver	09940-54910
②	Front fork oil seal installing tool attachment	09940-54920

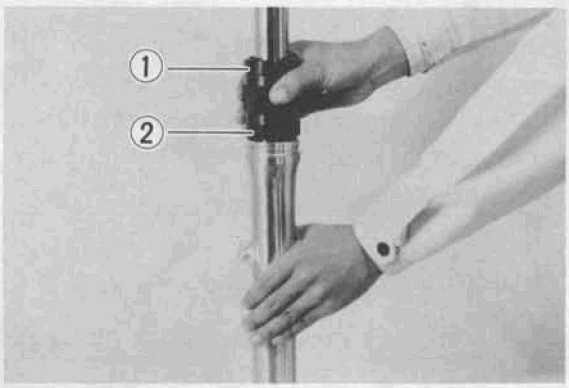


Fig. 11-28

- Place the washer on the upper surface of the oil seal and fit the oil seal stopper ring, using the special tools.
- Mount the dust seal.
- Use SAE 10W/20 oil.

Amount of front fork oil	251 ml on one side (8.48 US oz)

METHOD OF MEASURING FORK OIL LEVEL

- Carry out the measurement with front fork damper assembly removed from the motorcycle frame.
- Carry out the measurement using special tool ① with the front fork spring extracted and the inner tube fully compressed.
- Measure fork oil level by securing adjustable clip ② to the upper end of the inner tube as shown in the drawing.

Front fork oil level	140 mm (5.5 in)

If the oil is found to be over the level after measurement, drain the oil to the correct level using the oil pump lever.
If the oil is below the level, supply oil using the oil level gauge.

CAUTION:
Exceeding the specified oil level will lead to malfunctioning of the fork resulting in oil leakage, breakage, etc. Always make sure that the oil level is as specified.

Front fork oil level gauge	09943-74110

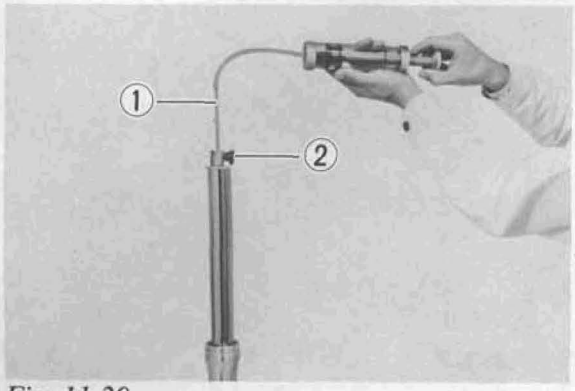


Fig. 11-29

- Insert the spring into the inner tube with closely coiled portion upward and mount the upper cap bolt.

ADJUSTING THE AIR FORK

The GS850G front fork is mechanical pneumatic type. The fork tubes contain compressed air, and coil springs are used to augment the pneumatic cushioning action. The air pressure is adjustable so that you can obtain a degree of "softness" to suit running conditions by raising or lowering the pressure.

AIR PRESSURE GAUGE

- Stand the motorcycle erect on the center stand, and raise the front end slightly by jacking up the underside of the engine.
- Remove the air valve cap.

Fig. 11-30

- Before attaching the special tool on the front fork, turn valve ① clockwise until it locks. Next turn freely valve ② counterclockwise until it turns freely. Mount valve nut ③ on the air valve of the front fork and turn it manually clockwise until it stops. Next turn valve ② clockwise until it locks. Inject air through air charging port ④ using an air pump (hand pump).

Front fork gauge	09940-44110

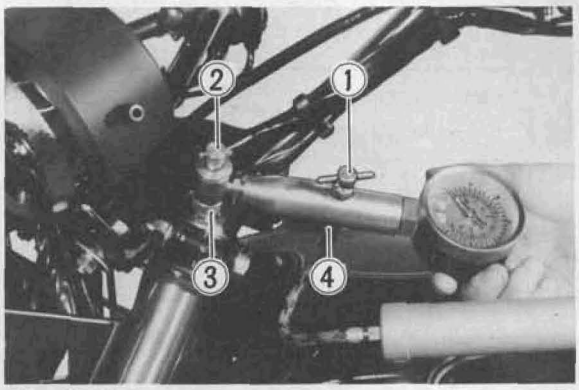


Fig. 11-31

- Inject 2 to 2.5 kg/cm² of air with the air pump to adjust the pressure to the specified value, carrying out fine adjustment with valve ①.
  When the specified pressure is obtaind, turn valve ① clockwise until it locks, loosen valve ②, and remove the gauge.
  Next, loosen valve nut ③ and remove the gauge from the front fork. Finally firmly fasten the valve cap.

CAUTION:
Inspect and adjust air pressure when the front fork is cold.
- *Only air or nitrogen should be used. Never use oxygen or any other gas.*
- *Never allow the charged gas to come into contact with, or near, fire.*
- *The specified pressure of the charged gas is as follows:*

Specified pressure	*0.6–1.2 kg/cm² (8.5–17 psi)*

However, it may be adjusted within the range of 0.6 kg/cm² (8.5 psi) to 1.2 kg/cm² (17 psi) according to the customer's requirements.

- *Never use an air compressor to inject air. Always supply air with a hand pump.*
- *Adjust the balance of the left and right pressures to within 0.1 kg/cm². Before riding, always inspect and if necessary, adjust the pressure to the reference pressure.*
- *The pressure must not exceed the following value.*

Max. charges pressure	*2.5 kg/cm² (35 psi)*

Air pressure above the max. valve will damage the fork leading to oil leakage, breakage, etc. Always maintain the pressure at the specified value.

WARNING:
Balance the front and rear suspension by referring to "MATCHING FRONT AND REAR FORKS". Changing the air pressure setting of front fork requires the spring and damper settings of the rear suspension to be changed in accordance with the instructions, and vice versa.

- *It is very important to bleed off all air pressure prior to changing the air pressure. At this time drain the air slowly, by degrees. Draining the air all at once may cause hydraulic fluid to be mixed into the oil.*

INSPECTION

- Inspect front fork spring.
  Measure the free length of the fork spring. Replace it with a new one when it is less than the service limit.

Standard	Limit
421 mm (16.6 in)	416 mm (16.4 in)

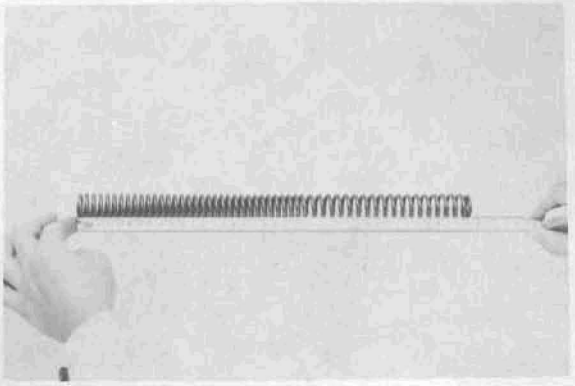
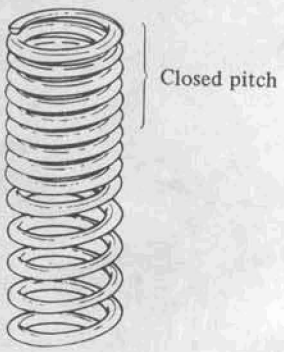


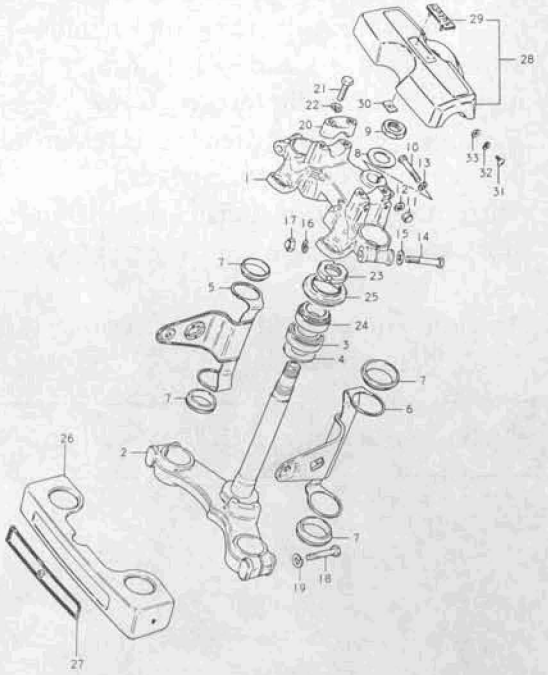
Fig. 11-32

- Inspect the inner tube.
  Visually inspect the sliding surface of the inner tube. Replace the inner tube with a new one if any flaws are found.
- Inspect the outer tube.
  Visually inspect the outer tube to see whether it is dented or damaged.
- Inspection for oil leakage.
  Replace the oil seal with a new one if oil leakage is found. Leakage is caused by intrusion of dust or flaws on the inner tube.

CAUTION:
Install the front fork spring that the closed pitch end is in up side.



STEERING STEM



1. Steering stem head
2. Steering stem
3. Lower bearing
4. Washer
5. Headlight bracket RH
6. Headlight bracket LH
7. Cushion
8. Washer
9. Nut
10. Bolt
11. Nut
12. Lock washer
13. Washer
14. Bolt
15. Washer
16. Lock washer
17. Nut
18. Bolt
19. Lock washer
20. Handlebar upper clamp
21. Bolt
22. Lock washer
23. Steering stem nut
24. Bearing
25. Dust seal
26. Front fork cover
27. Emblem
28. Handlebar pad
29. Emblem
30. Nut
31. Screw
32. Lock washer
33. Washer

Fig. 11-33

REMOVAL

- Remove the fuel tank.
- Remove the three headlight retaining screws, draw out the socket connected to the headlight and remove the headlight.
- Remove the lead wires connected to the interior of the headlight.
- Remove the two bolts fastening the headlight housing and remove the housing from headlight bracket.
- Remove the tachometer cable and speedometer cable on the meter side.
- Remove handlebar pad.
- Remove the two bolts fastening the meter and remove the meter assembly.

  Remove the connection coupler at the end of lead wire.
- Before removing the front wheel, loosen steering stem head center locking nut ① and stem head center bolt ②.

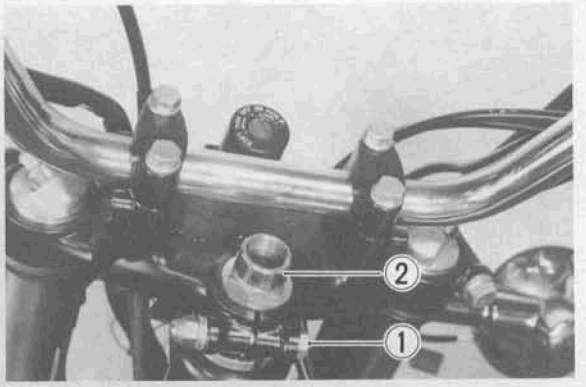


Fig. 11-34

- Remove the four caliper mounting bolts and remove the caliper assemblies from the right and left front fork.

  Then suspend the removed calipers from the motorcycle frame with string so as not to bend the oil hoses.

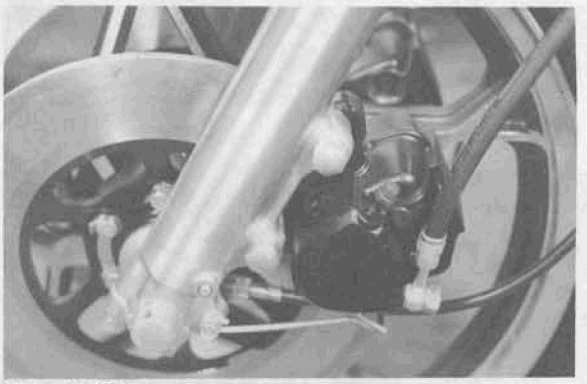


Fig. 11-35

- Remove the front wheel.
- Remove the front fender.
- Loosen the left and right upper pinch bolts and lower pinch bolts securing the front forks.

  Draw out the front fork while rotating it. While removing each front fork, hold the left and right headlight brackets to prevent them falling.

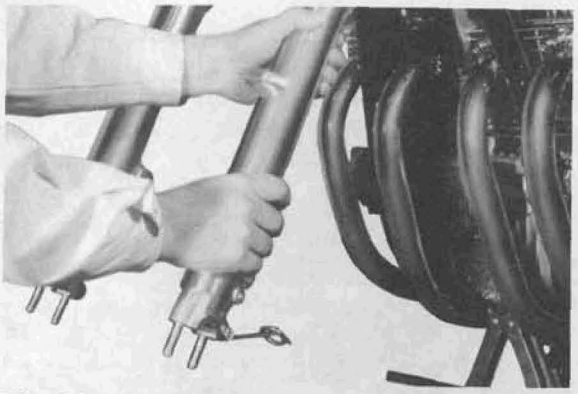


Fig. 11-36

- Remove front fork cover.
- Remove the two master cylinder mounting bolts ① on the handle bar.
  At this time take care not to bend the oil hose.

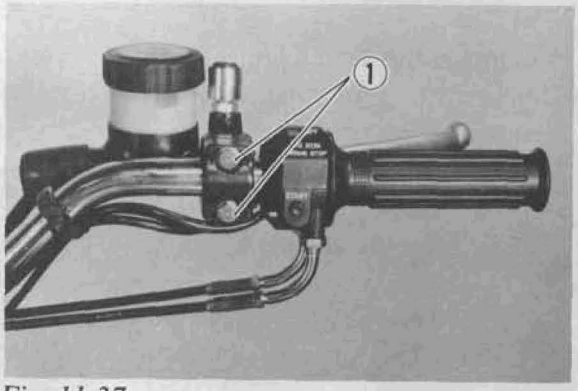


Fig. 11-37

- Remove one bolt fastening the oil hose joint at the lower portion of the steering stem and remove the oil hose joint from the lower portion of the steering stem.
  The series of parts from the master cylinder to the caliper assembly can now be removed.

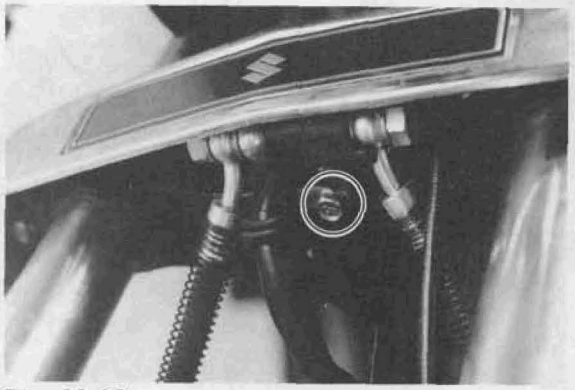


Fig. 11-38

- Remove the four clamp bolts securing the handle bar and remove the handle bar assembly with grip, cable and handle bar switch together, and place them on the upper part of the motorcycle frame.
- Remove the steering stem head center bolt and remove steering stem head.
- Turn the steering stem nut ① counter-clockwise and remove it using special tool ②.
  At this time hold the steering stem carefully to prevent it falling.

Steering nut socket wrench	09940-14910

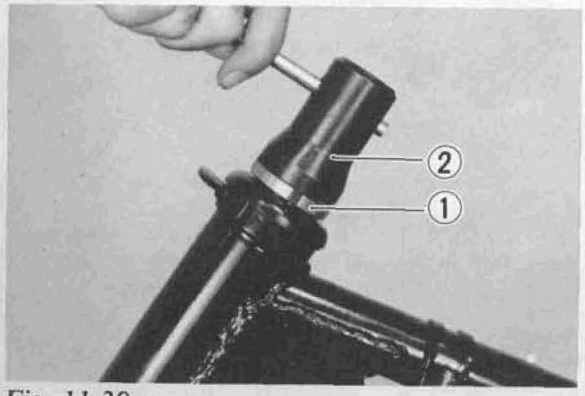


Fig. 11-39

- Remove the upper dust seal and remove the steering stem.

ASSEMBLY

- Wipe dirt off the upper and lower bearing races with a rag. In addition, thoroughly wash the bearings with detergent.
- Apply a suitable amount of water-resistant chassis grease to the upper and lower bearings.

Fig. 11-40

- Insert the steering stem into the head pipe from below. Place the upper bearing on the upper portion of the head pipe, place the upper dust seal on the bearing and tighten the steering nut. Tighten the nut using the special torque wrench ①.

Steering nut socket wrench	09940-14910

Steering stem nut tightening method

NOTE:
Tighten the steering stem lock nut to a sufficient degree for assembling. It can be changed during subsequent readjustment of the steering.

CAUTION:
The following adjustment procedure applies when the front fork has already been set. Follow the steps below for adjusting and checking the steering stem.

1. Using the steering nut, socket and a torque wrench, tighten the stem nut to 4.0—5.0 kg-m (29.0—36.0 lb-ft.)

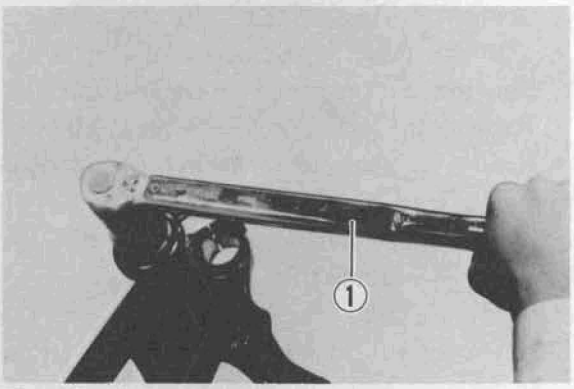


Fig. 11-41

2. Move the steering stem back and forth five or six times to seat the bearings.
3. Turn the steering stem nut back to 0 kg-m. Then retighten very lightly so that no play can be detected in the stem.
4. Install the steering stem head and temporarily tighten the steering stem head center bolt to 2.0—3.0 kg-m (14.5—21.5 lb-ft).
5. Tighten the steering stem side bolt to 1.5—2.5 kg-m (11.0—18.0 lb-ft).
6. Turn the stem nut back slightly and tighten the steering stem head center bolt to it's normal torque of 3.6—5.2 kg (26.0—37.5 lb-ft). When the front fork is moved back and forth, it must move freely. If there is any play in the forks, loosen the center bolt, tighten the stem nut slightly and retorque the center bolt.

Steering stem head center bolt:	3.6—5.2 kg-m (26.0—37.5 lb-ft)
Steering stem side bolt:	1.5—2.5 kg-m (11.0-18.0 lb-ft)

- Install the handle bar using the two clamps and four bolts.

Tightening torque:	1.2—2.0 kg-m (8.5—14.5 lb-ft)

- Push the main wire harness ① forward through the left lower portion of the steering stem. A bolt fastens the oil hose joint on the lower portion of the steering stem. The holder is fastened by this bolt together with other parts. Firmly secure the wire harness with this holder after assembling the hose joint.
- Route clutch cable ② and lead wires ③, ④ of left and right handle bar switches to the front side of the steering stem head as shown in the drawing.

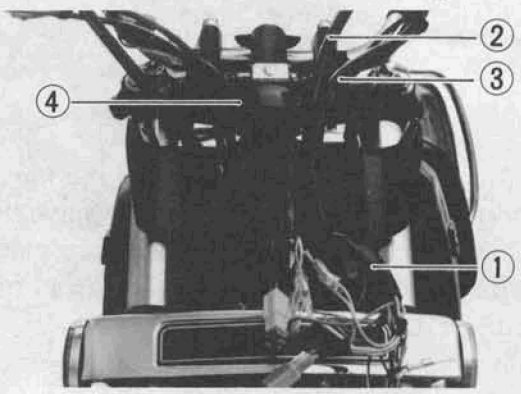


Fig. 11-42

- Secure the meter assy with the two bolts.
- Install tachometer cable ②.
  Now, thread the tachometer cable through the bottom of the steering stem to the front of steering stem head as shown in the drawing. Install the speedometer cable after mounting the front wheel. See page 11-23.

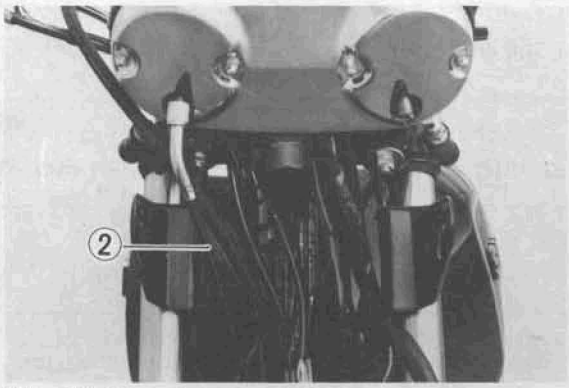


Fig. 11-43

- Secure the front master cylinders each with two bolts ① . Maintain a clearance ② between the right handle bar switch and the master cylinder of 2 mm (0.08 in).

Tightening torque	0.5–0.8 kg-m (3.5–6.0 lb-ft)

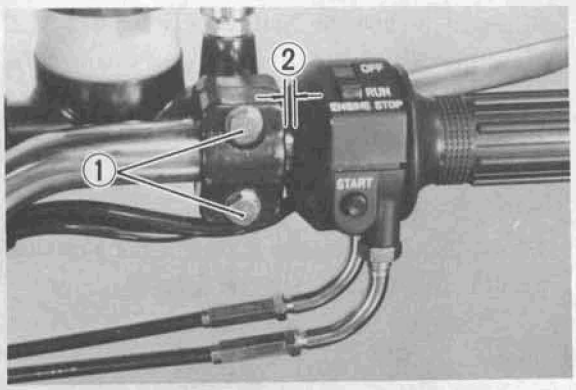


Fig. 11-44

- Attach the brake hose joint to the lower portion of the steering stem with one bolt. Then tighten the clamp securing the main wire harness. Suspend the caliper from the motorcycle frame by string.
- Fit the headlight brackets into the intermediate portion between the steering stem head and steering stem without mistaking the left or right positions. Now, replace the front fork cover.
- Insert the left and right front forks from the underside of the steering stem and tighten the front fork upper pinch bolt and lower pinch bolt. Then align the end of the inner tube with the upper end of the stem head.

Tightening torque:	
Front fork upper pinch bolt:	2.0–3.0 kg-m (14.5–21.5 lb-ft)
Front fork lower pinch bolt:	1.5–2.5 kg-m (11.0–18.0 lb-ft)

- Secure the front caliper assembly to the right and left front forks with the two bolts.

Tightening torque:	2.5–4.0 kg-m (18.0–29.0 lb-ft)

- Secure the front fender with the four bolts.
- Mount the front wheel.
- Thread speedometer cable through the cable guide mounted on the fender and along the brake hose joint through the middle part between the front fork cover and steering stem and mount it on the meter side.
- Confirm that the speedometer gear box is positioned correctly (see page 11-10).
- Remove the jack from under the engine.
- Route the main wire harness ①, ignition switch lead wire ②, right handlebar switch lead wire ③, front brake switch lead wire ④ and turn signal light lead wire ⑤ through the lower hole of the headlight housing and fasten them together using the headlight bracket.

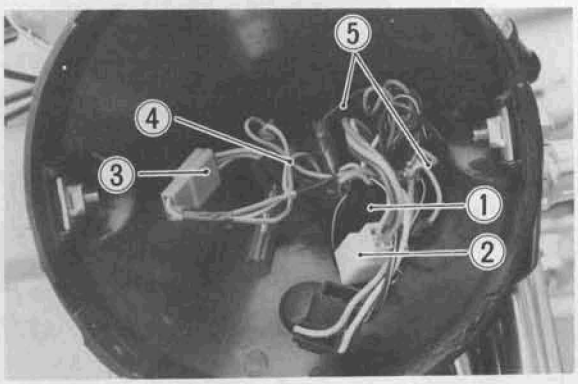


Fig. 11-45

- Connect each lead wire (see page 11-7).
- Secure the headlight with the three screws.
- Adjust the vertical angle of the headlight beam (see page 11-7).

REMOVAL OF STEERING STEM RACE

- Place a jack under the engine.
- Hook special tool ① on the race and use special tool ② to remove the upper and lower races.

①	Steering stem inner race remover	09941-54911
②	Inner race and bearing driver	09941-74910

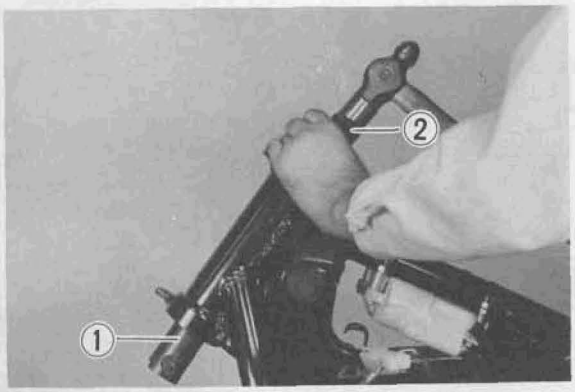


Fig. 11-46

MOUNTING

- Apply a small amount of motor oil to the outer periphery of the upper and lower races and start them into the head pipe by tapping them lightly with a plastic hammer.
- Press in the lower and upper races using special tool ①.

Using special tool

- Two of the four tapered guides set in the special tool ① are to be used. Place the one with the larger outer diameter below and the other with the smaller outer diameter above and press-fit the race while rotating it.
  Then tighten the nut until it locks completely.

Steering inner race and swinging arm bearing installer	09941-34511

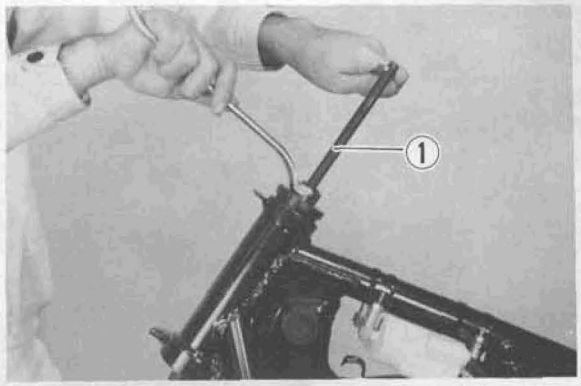


Fig. 11-47

STEERING STEM BEARING

REMOVAL

- Remove bearing using special tool ①.

Use of special tool

- Firmly fit the holder into the roller portion of steering stem bearing. Next, fit the ring into the holder and screw the two shafts into the upper portion of the holder.
  Screw attachment ② into the top of the steering shaft and remove the bearing while rotating the handle.

Bearing inner race remover	09941-84510

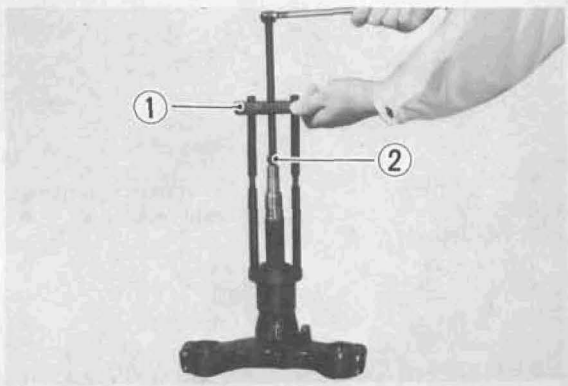


Fig. 11-48

MOUNTING

- Apply a small amount of motor oil to the inside of the bearing and press it into the steering stem shaft using special tool ①.
  Lubricate bearing with grease.

Race and bearing driver	09941-74910

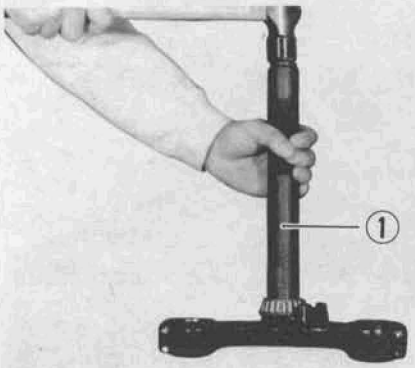
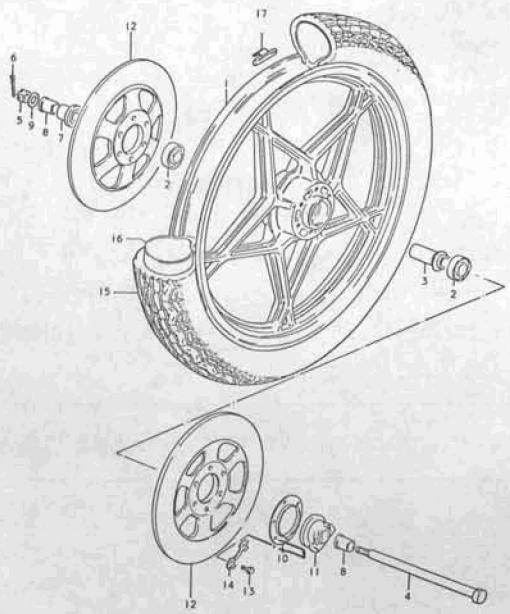


Fig. 11-49

FRONT WHEEL



1. Front wheel
2. Bearing
3. Spacer
4. Front axle
5. Nut
6. Cotter pin
7. Bearing spacer
8. Axle spacer
9. Washer
10. Dust seal
11. Speedometer gear box
12. Front brake disk
13. Bolt
14. Washer
15. Tire
16. Inner tube
17. Balancer

Fig. 11-50

REMOVAL

- Lift the front wheel off the floor by raising up the engine, with the center stand resting firmly on the ground.
- Disconnect the speedometer cable from the wheel.
- Pull off cotter pin ① from axle nut ②; and loosen the nut. Remove the axle holders, right and left, and take off the wheel.

CAUTION:
After removing the front wheel, do not squeeze the front brake lever or the brake pads will move inside the caliper. The pads should be left where they are at the time of wheel removal otherwise difficulty will be encountered in reinstalling.

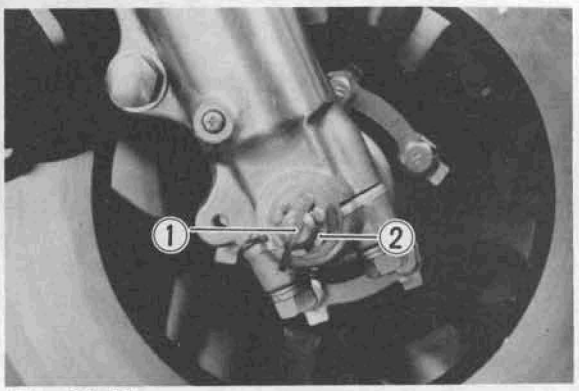


Fig. 11-51

- Unlock the 6 bolts securing the disk to the wheel hub after straightening the lock washers. Remove the bolts and separate the disk from the wheel.
- Similarly remove the disk on the other side.

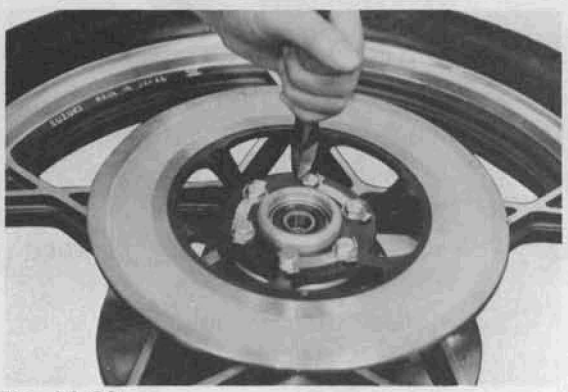


Fig. 11-52

- Insert an iron bar into the front hub from the speedometer gear box side and tap the circumference of the ball bearing inner race uniformly to remove the bearing.

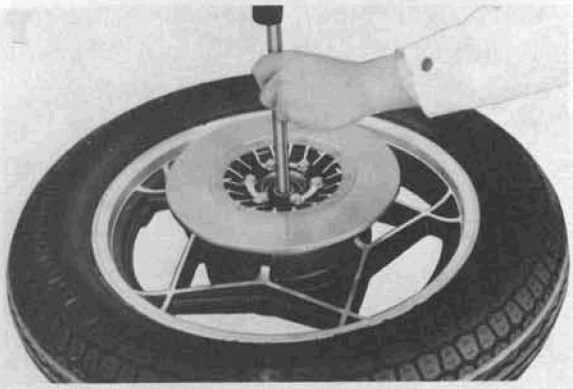


Fig. 11-53

- Similarly, insert an iron bar into the front hub and uniformly tap the periphery of the ball bearing inner race on the opposite side to remove the bearing.

INSPECTION

- Using a micrometer check the disk for wear. The thickness can be checked with the disk and wheel in place. The thickness limit of the disk is specified below:

Front Brake disk Thickness

Standard	Limit
5.9—6.1 mm (0.23 – 0.24 in)	Under 5.5 mm (0.22 in)

- With the disk mounted on the wheel, check the disk for face runout with a dial gauge, as shown.

Front brake disk runout

Service Limit	0.30 mm (0.012 in)

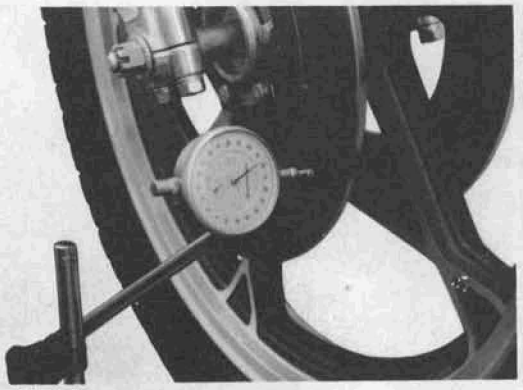


Fig. 11-54

- Inspect the play of wheel bearing inner race by hands while fixing it in the wheel hub or wheel. Rotate the inner race by hands to inspect whether abnormal noise occurs or rotating smoothly.
  Replace the bearing if there is something unusual.

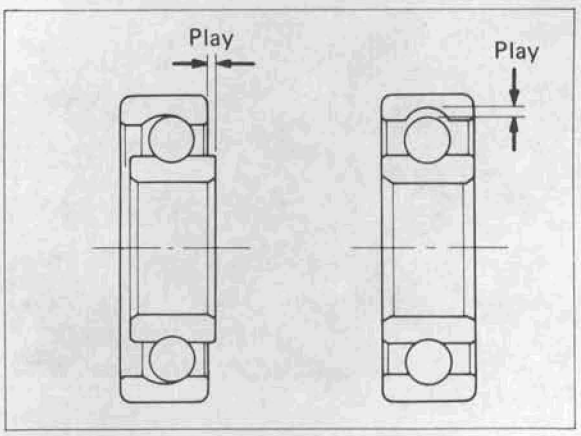


Fig. 11-55

- Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

Front axle runout

Service Limit	0.25 mm (0.010 in)

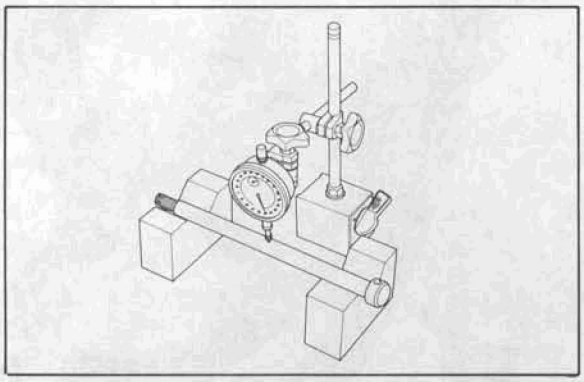


Fig. 11-56

- Inspect the tire for wear and damage, and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with its tread worn down to the limit (in terms of tread depth) must be replaced.

Front tire tread depth

Service Limit	1.6 mm (0.06 in)

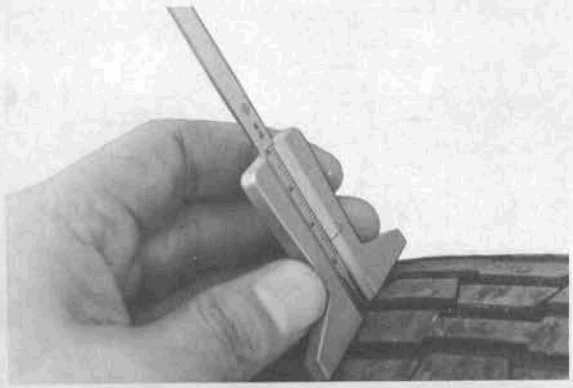


Fig. 11-57

TIRE WARNING

Check tire pressure and general tire condition frequently. Suzuki recommends replacement only with the specified size Dunlop or Inoue brand H-rated tire.

Tire Inflation Pressure Model GS 850G		Solo Riding		Dual Riding	
		kg/cm²	Psi	kg/cm²	Psi
Normal Riding	Front	1.75	25	1.75	25
	Rear	2.00	28	2.00	28
Continuous High Speed Riding	Front	2.00	28	2.25	32
	Rear	2.25	32	2.80	40
TIRE SIZE: FRONT 3.50H19-4PR REAR 4.50H17-4PR					

* TIRE PRESSURE SHOULD BE MEASURED WHEN TIRE IS COLD.

- Check the tire pressure, and examine the valve for evidence of air leakage.
- Check the wheel for axial and radial runout. For the axial runout, apply the dial gauge spindle horizontally to the rim; for the latter, point the spindle radially to the inner surface of the rim.
- Support both ends of the shaft to inspect runout of the rim with a dial gauge.

Front wheel rim runout

Runout	Service Limit
AXIAL	2.0 mm (0.08 in)
RADIAL	2.0 mm (0.08 in)

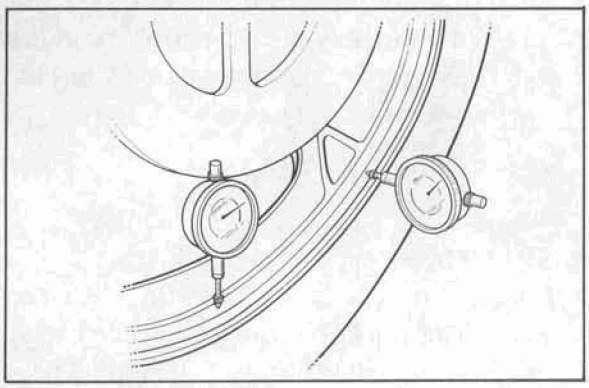


Fig. 11-58

- Spin the wheel (complete with the brake disk and tire) to check dynamic balance. Use a 20-gram or 30-gram balancing piece, as necessary. Spin the wheel several times and make sure that the wheel comes to a natural halt not in a particular position but in random positions each time.

Wheel balancer

Weight	Part Number
20 grams (0.04 lbs)	55411-45100
30 grams (0.07 lbs)	55412-45100

IMPORTANT:
Remember that the wheel will not be dynamically balanced when the tire is replaced or repaired after a puncture: the wheel must be rebalanced each time its mass is altered.

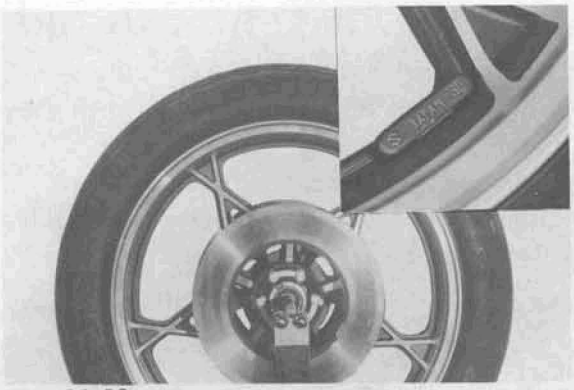


Fig. 11-59

NOTE:
When attaching a balance weight to the wheel (rim), use a plastic hammer to prevent damaging to the wheel. Never use a metal hammer.

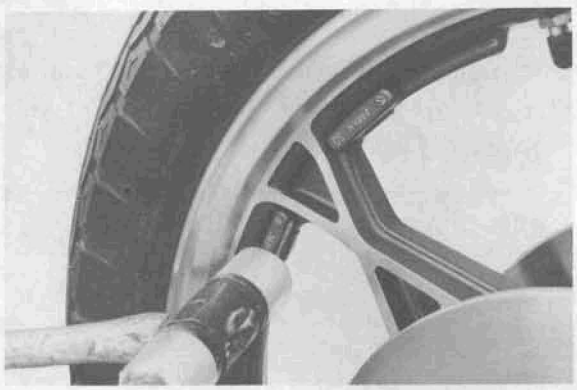


Fig. 11-60

NOTE:
When removing a balance weight, use wheel weight pliers.

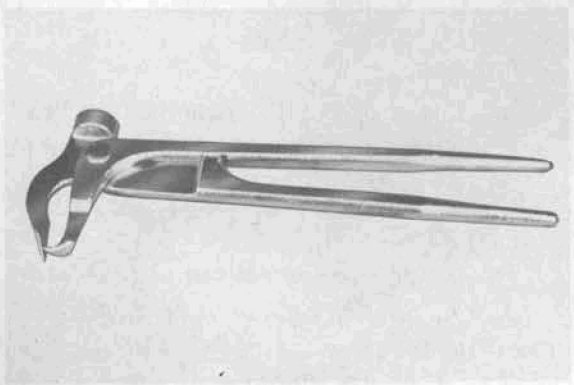


Fig. 11-61

ASSEMBLY

- Reassemble and remount the front wheel in the reverse order to disassembly and removal in addition to the following items:
- Use special tool ① to install the wheel bearings. These bearings are driven into the hub bore.

Bearing installer	09914-79610

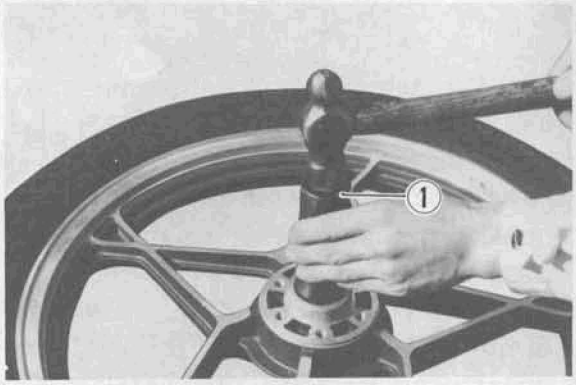


Fig. 11-62

- Make sure that the brake disk is clean and free from grease. Use only non petro-based cleaner. After securing it in place by tightening the bolts, be sure to lock each bolt by firmly bending down the lock washer tongue.

Disk plate tightening torque	1.5–2.5 kg-m (11.0–18.0 lb-ft)

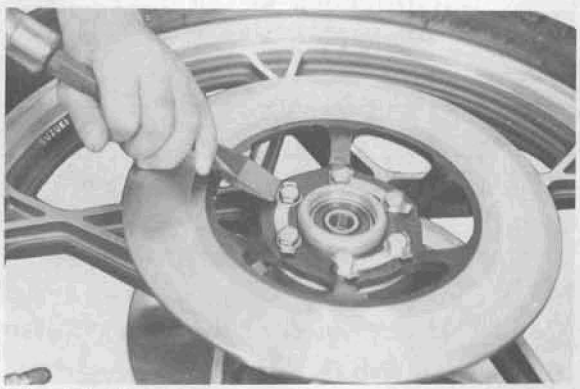


Fig. 11-63

- Before installing the speedometer gear box ①, grease it and align groove ② (for fitting the two drive pawls to the hub) with the hub to insert the gear box in the wheel.

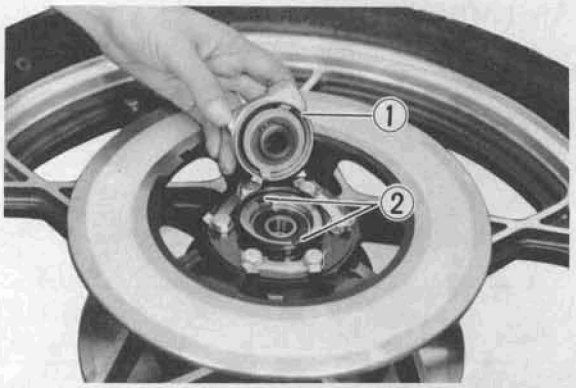


Fig. 11-64

- Insert an axle spacer into the front wheel and insert the front axle. Next, from the right side, assemble the bearing spacer, cover, axle spacer, washer and nut in that order and temporarily tighten the axle nut. See page 11-10 for the order of assembly.
- With the axle shaft mounted, place the front wheel under the front fork and lower the jack placed under the engine to the front fork.
- Do not change the position of the speedometer gear box (see page 11-10).
- Tighten axle nut.

CAUTION:
To prevent the axle shaft rotating while tightening the axle nut, insert a round bar into the head of the shaft on the disk plate side. Rotation of the shaft may lead to bending of the speedometer cable.

Axle shaft tightening torque	3.6–5.2 kg-m (26.0–37.5 lb-ft)

- Mount the axle holder on the lower portion of the front fork. Maintain a uniform clearance between the axle holder and the fork side front and rear (see page 11-10).

Axle holder tightening torque	1.5–2.5 kg-m (11.0–18.0 lb-ft)

- Remove the jack from under the engine.

REMOVAL OF TUBE AND TIRE

- Mark the position of the tires and rotational direction of the valve stem with chalk.
- Remove the valve cap and let out the air.
- Remove the valve fastening nut and fully loosen the bead protector nut.

Fig. 11-65

- Step on the tire bead, push it down and as shown below, install the five wheel rim protectors (special tools) to the wheel.

Wheel rim protector	09941-94510

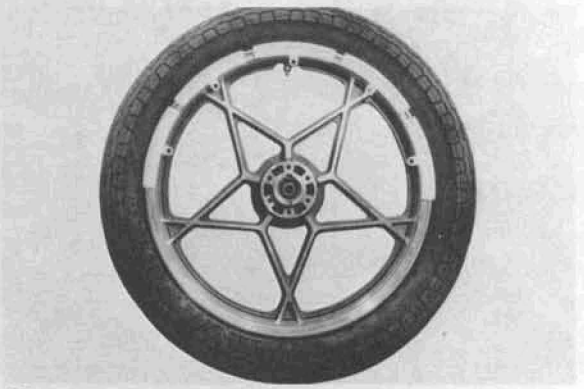


Fig. 11-66

- Using flat tire levers, work the tire bead over the rim, starting near the valve stem.

CAUTION:
1. *Always use the wheel rim protectors. If not, the tire rim could be damaged by the tire lever.*
2. *The tire lever should be applied over the wheel rim protectors.*

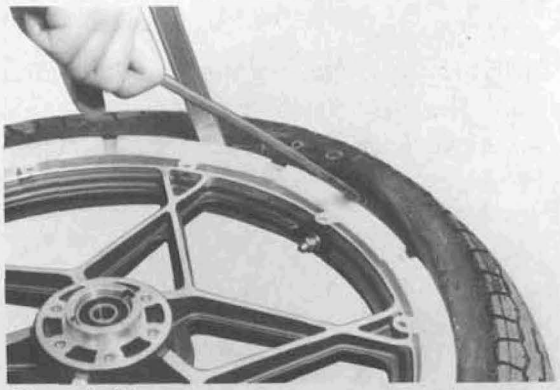


Fig. 11-67

- Remove the tube.
- Remove the tire from the wheel.

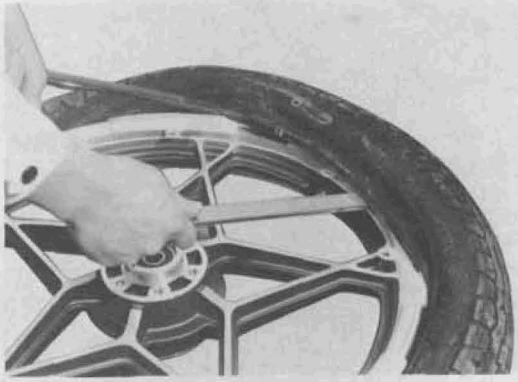


Fig. 11-68

MOUNTING

- Inflate the tube sufficiently so that the tube does not fold.
- Press the tube into the tire.
- Push one side of the tire beads into the wheel rim. Be sure that the embossed arrow mark on the tire faces toward the rotational direction of the wheel.
  Next, install the tube, insert the valve into the rim, and tighten the valve nut temporarily. An arrow indicating the rotational direction is marked on the rear tire.
  A yellow mark is provided on the valve portion to aid checking of the tire balance.

Fig. 11-69

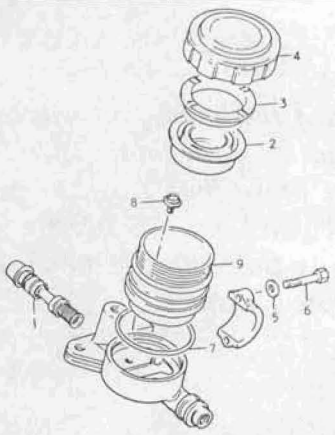
Fig. 11-70

- Apply soapy water to the tire bead.
- Hook the bead protector on the bead portion of the tire.
- Fit the rest of the tire using tire levers in a position well away from the valve.

CAUTION:
1. Avoid inserting the tire lever too deeply into the tube (to avoid damaging the tube).
2. As in tire removal, use the wheel rim protectors.

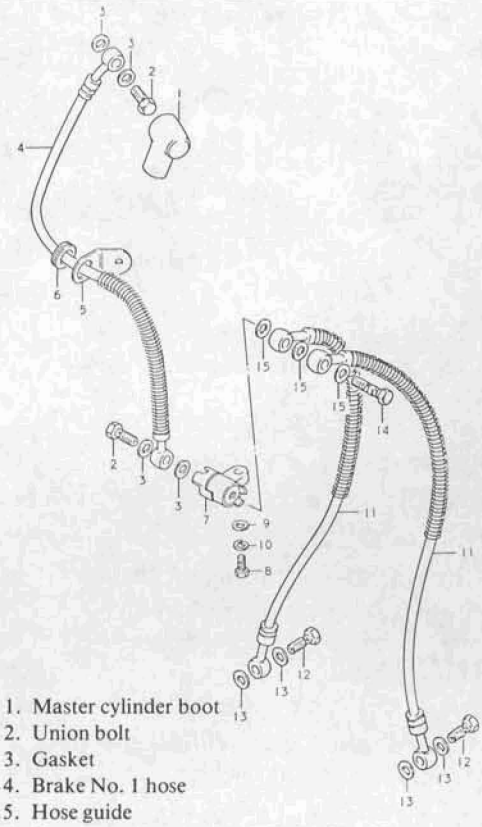
- By pushing the tire, confirm that the tube is not caught between the rim and tire.
- Inflate the tire to the specified pressure (see page 11-22).
- Tighten the bead protector nut and then the valve nut.
- Mount the valve cap.

FRONT BRAKE MASTER CYLINDER



1. Piston & cup set
2. Diaphragm
3. Diaphragm plate
4. Cap
5. Washer
6. Bolt
7. O ring
8. Screw
9. Reservior

Fig. 11-71



1. Master cylinder boot
2. Union bolt
3. Gasket
4. Brake No. 1 hose
5. Hose guide
6. Grommet
7. Brake hose joint
8. Bolt
9. Washer
10. Lock washer
11. Brake No. 2 hose
12. Union bolt
13. Gasket
14. Union bolt
15. Gasket

Fig. 11-72

REMOVAL

- Remove the headlight.
- Remove the front brake switch lead wire connected within the headlight housing.
- Remove the union bolt.

CAUTION:
Loosening of the union bolt will cause brake fluid to flow out. Therefore, remove the brake fluid from the brake fluid cup beforehand. Completely wipe off any brake fluid adhering to any part of the motorcycle frame.

MOUNTING

- Mount the master cylinder on the handlebar.

CAUTION:
A clearance of about 2 mm (0.08 in) Ⓐ must be provided between the right-hand handlebar switch and the master cylinder.

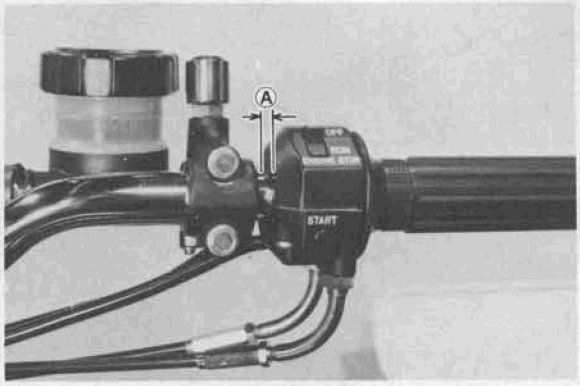


Fig. 11-73

- Refer to the illustration to reconnect the brake hose to the master cylinder.

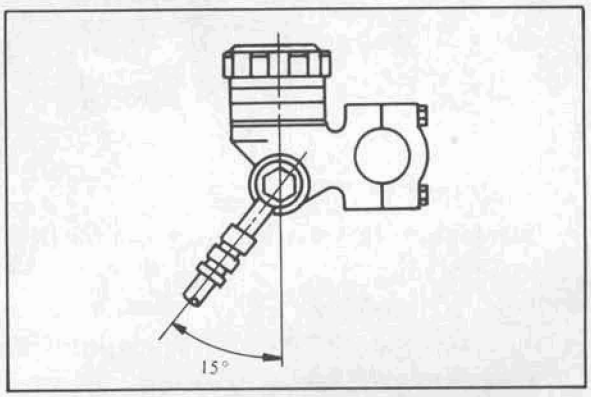


Fig. 11-74

- Connect the front brake light switch lead wire within the headlight housing.
- Secure the headlight with the three screws.

AIR BLEEDING THE BRAKE FLUID CIRCUIT

Air trapped in the fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the caliper brake. The presence of air is indicated by "sponginess" of the brake lever and also by lack of braking force. Considering the danger to which such trapped air exposes the machine and rider, it is essential that, after remounting the brake and restoring the brake system to the normal

condition, the brake fluid circuit be purged of air in the following manner:

- Fill up the master cylinder reservoir to the "High" level line. Replace the reservoir cap to prevent entry of dirt.

Fig. 11-75

Bleeder valve tightening torque	0.6–0.9 kg-m (4.5–6.5 lb-ft)

- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.

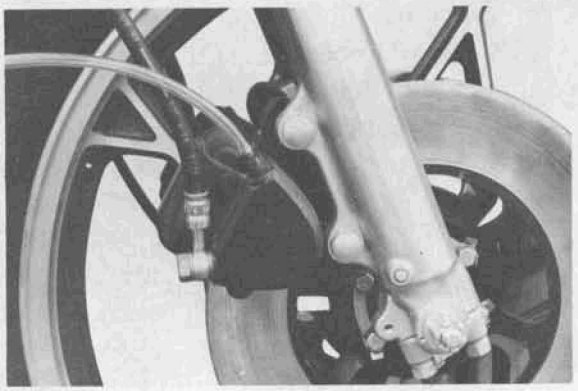


Fig. 11-76

- Bleed the left caliper first, and then the right caliper.
- Squeeze and release the brake lever several times in rapid succession, and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn or so so that the brake fluid runs into the receptacle; this will remove the tension of the brake lever causing it to touch the handlebar grip. Then, close the valve, pump and squeeze the lever, and open the valve. Repeat this process until the oil flowing into the receptacle no longer contains air bubbles.

NOTE:
Replenish the brake fluid reservoir as necessary while bleeding the brake system. Make sure that there is always some fluid visible in the reservoir.

- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the "High" level line.

CAUTION:
Handle the brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials, etc.

MASTER CYLINDER DISASSEMBLY.

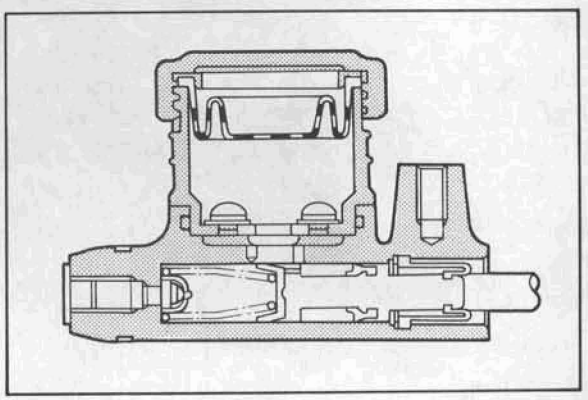


Fig. 11-77

- Remove the front brake lever: pull off the cotter pin and remove the nut to free the lever for removal.
  Remove the boot. Take out the circlip from the bore of the master cylinder with special tool ①.

NOTE:
Discard the removed boot. Replace with a new boot when reassembling.

Snap ring pliers	09900-06105

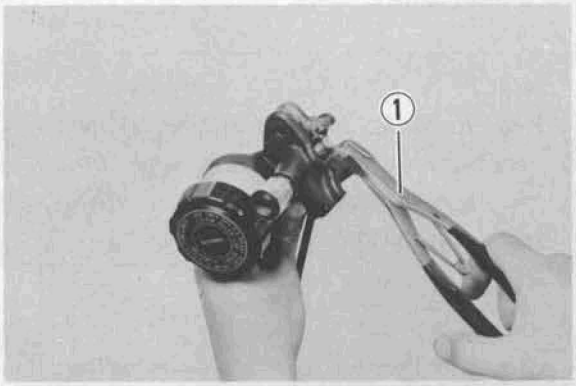


Fig. 11-78

- Take out the piston, check valve, coil spring and primary cup from the bore.

NOTE:
Using a piece of wood or soft-metal, push out the check valve coil spring and primary cup. Avoid scratching the bore wall.

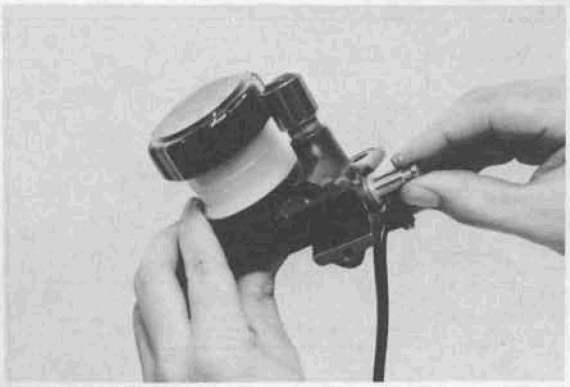


Fig. 11-79

- Remove two screws ① securing the reservoir to the master cylinder body, and take off the "O" ring from the body.

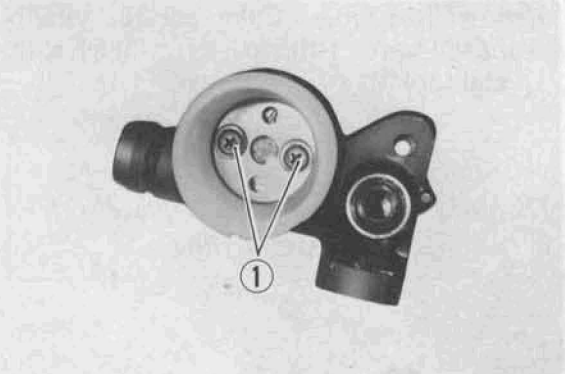


Fig. 11-80

INSPECTION OF MASTER CYLINDER

- Check the fit of the reservoir with the cylinder body. The "O" ring should be replaced with a new one when the master cylinder is disassembled.
- Inspect the primary cup for wear and damage, and replace it with a new one if necessary.

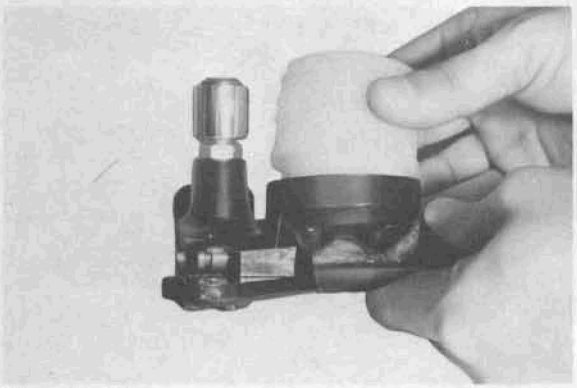


Fig. 11-81

- Replace the brake hose every two years.

ASSEMBLY

- Reassemble the master cylinder in the reverse order to disassembly with the following additional steps:
- Apply brake fluid to the cylinder bore and all the internal parts to be inserted into the bore. Do not attempt to insert one part after another into the bore; assemble the primary cup, coil spring and check valve together, and insert this assembly into the bore, taking care not to allow the check valve to become cocked or to unseat the coil spring as it goes into the bore.

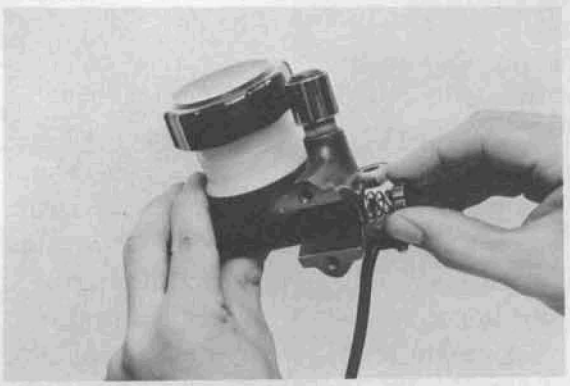


Fig. 11-82

- It is advisable, though not essential, to replace the primary cup with a new one in reassembly.

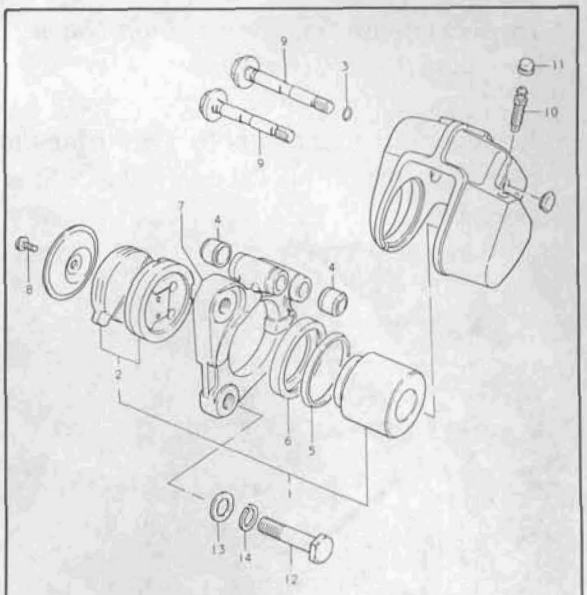
CAUTION:
Always install the circlip with the sharp edge away from the spring.

- After fitting the circlip, try to turn it in place to make sure it is snugly seated in the groove. Replacing the circlip with a new one advisable instead of re-using the circlip removed in disassembly.

Fig. 11-83

- Reconnect the brake lever to the master cylinder before mounting the master cylinder on the handlebar. Mount to the handlebar as described in page 11-2.

FRONT BRAKE CALIPER



1. Piston & pad set
2. Pad set
3. O ring
4. Axle dust cover
5. Piston seal
6. Piston boot
7. Caliper holder
8. Screw
9. Caliper axle
10. Bleeder
11. Cap
12. Bolt
13. Washer
14. Lock washer

Fig. 11-84

REMOVAL

- Disconnect brake hose No. 2 ① from the caliper, and catch the brake fluid in a suitable receptacle. Squeeze the brake lever to push out the fluid.

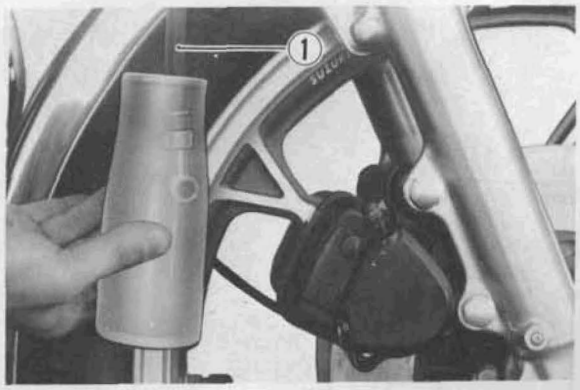


Fig. 11-85

CAUTION:
Do not splash the brake fluid when removing the caliper assembly.

- Remove two mounting bolts ① securing the caliper to the fork. Take off the caliper assembly.

Fig. 11-86

MOUNTING

- Tighten two caliper mounting bolts.

Tightening torque	2.5–4.0 kg-m (18.0–29.0 lb-ft)

- Tighten the brake hose union bolt.

Tightening torque	1.5–2.5 kg-m (11.0–18.0 lb-ft)

- Pour brake fluid into the reservoir up to the "High" level line.
- See page 11-26 for air bleeding of the caliper and brake hoses.

CALIPER

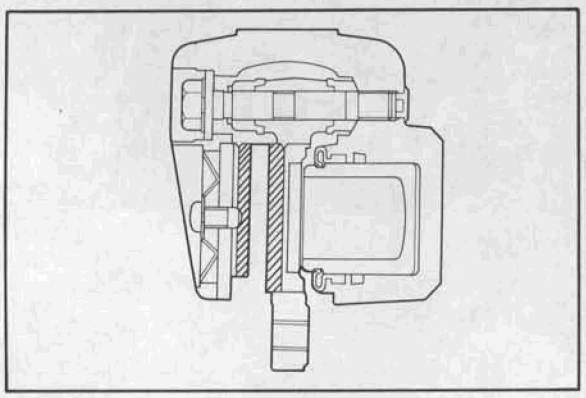


Fig. 11-87

CALIPER DISASSEMBLY

- Loosen and remove the two caliper axle bolts.

Fig. 11-88

- Remove screw ① fastening No. 2 pad (stationary) to the caliper body, and take out the pad. Separate the caliper holder from the body.

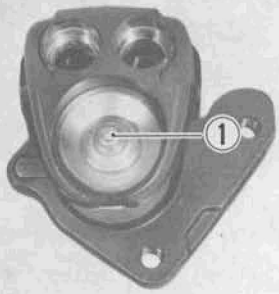


Fig. 11-89

- Apply compressed air (2.0 kg/cm², 28 psi) to the oil hose connection to push out the piston.

NOTE:
Remove the piston boot to facilitate piston removal.

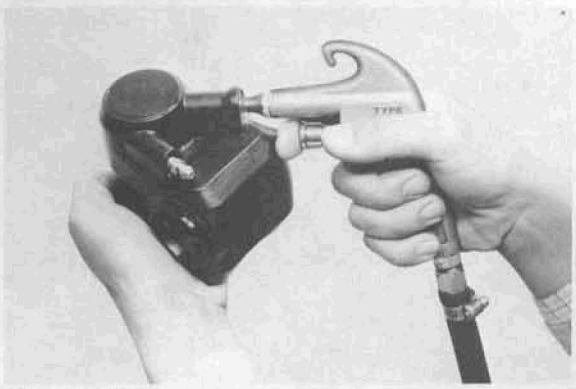


Fig. 11-90

- After removal of the caliper holder, take out the piston seal, dust seal, piston boot and "O" ring. Wash the piston seal and piston boot clean with fresh brake fluid. Discard the removed dust seal and "O" ring: always use a new seal and "O" ring in reassembly.

CAUTION:
Do not use such a cleaning fluid as trichlene or even gasoline to wash the piston seal and boot.

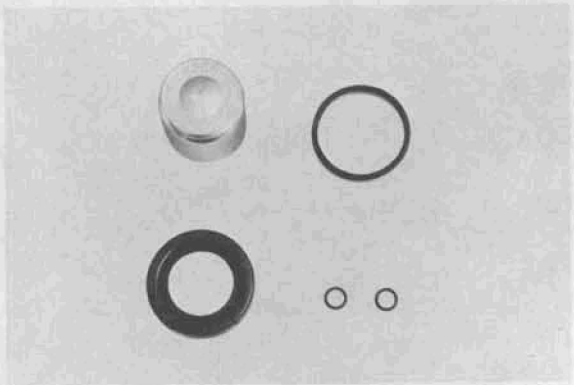
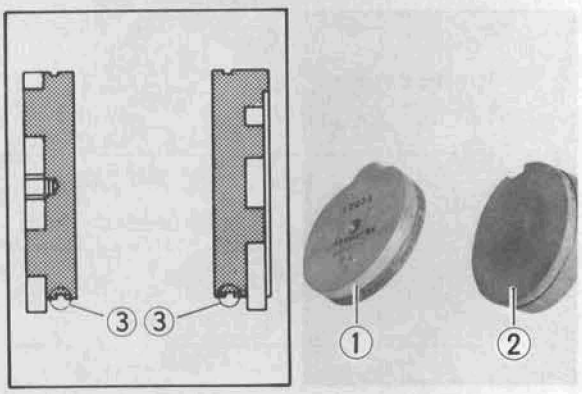


Fig. 11-91

INSPECTION

- Check brake pads for wear. A pad worn down to the limit (indicated by the red groove on the edge) must be replaced.



1. Pad No. 2
2. Pad No. 1
3. Red groove

Fig. 11-92

ASSEMBLY

- Apply brake fluid to the piston seal ① and fit it into the caliper body.

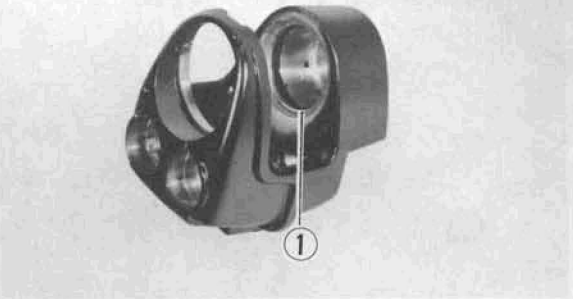


Fig. 11-93

- Fit the caliper holder ①, to the body, taking care not to damage the dust seal.
- Apply brake fluid to the piston, and insert it into the bore.

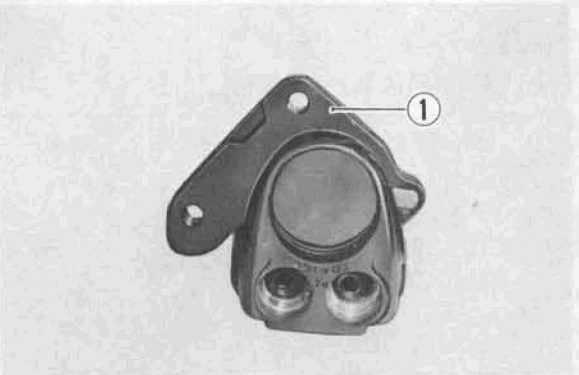


Fig. 11-94

- Apply a thin film of SUZUKI SILICONE GREASE to the brake pad on the floating side. Do not apply a thick coat, or never use any other brand grease. Otherwise, the grease smears the disk surface, thus causing the brake to slip.

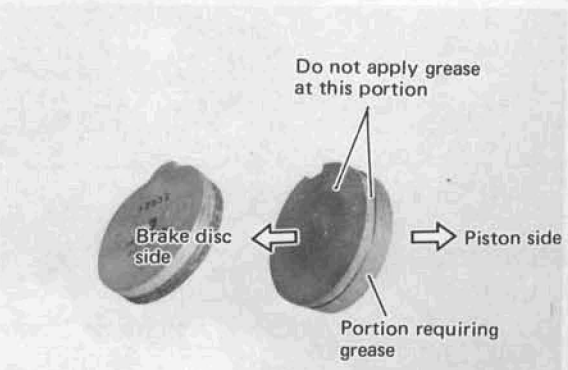


Fig. 11-95

- Coat caliper axle bolts ① with SUZUKI caliper axle grease ②, and install the bolts. Mount the caliper assembly, securing it to the front fork. Check that the pads are not in an abnormal dragging condition, i.e., dragging excessively on the disk.

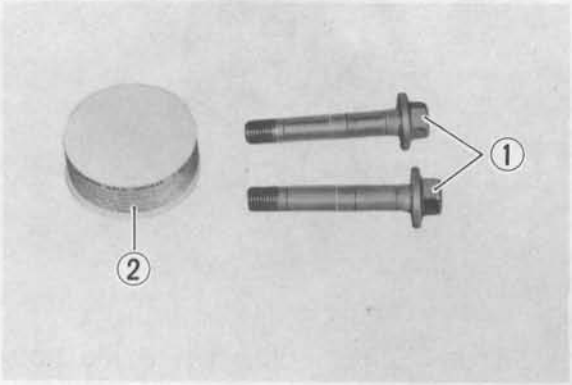
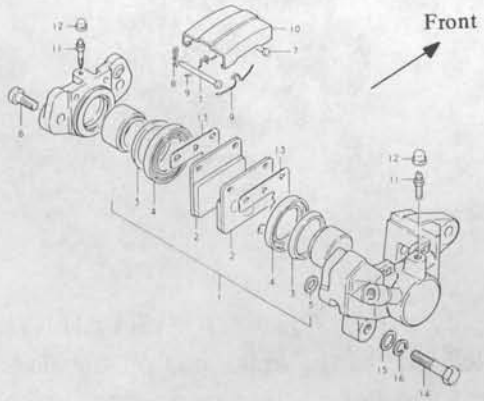


Fig. 11-96

REAR BRAKE CALIPER



1. Piston & pad set
2. Pad
3. Piston seal
4. Piston boot
5. O ring
6. Housing bolt
7. Pin
8. Clip
9. Spring
10. Dust cover
11. Bleeder
12. Cap
13. Shim
14. Bolt
15. Washer
16. Lock washer

Fig. 11-97

REMOVAL

- Remove the oil hose union bolt.

CAUTION:
Brake fluid will damage paint and plastic.

Loosening the oil hose union bolt ① causes the brake fluid to flow out. Block the hose with a rag, etc., to prevent the brake fluid coming in contact with the motorcycle frame.

- Remove the two caliper mounting bolts ②.
- Remove nut ③ together with the rear torque link bolt and rear caliper, and remove the wheel side bolt towards the wheel side.

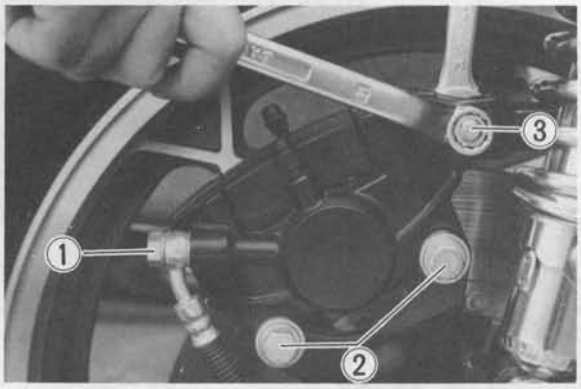


Fig. 11-98

- Remove the caliper assembly from the motorcycle frame by drawing it upwards.

MOUNTING

- With the disk pads opened, insert the caliper assembly into the upper portion of the brake disk.
- It with the fastening nut.
- Next tighten the caliper mounting bolts.

Tightening torque	2.0–3.0 kg-m (14.5–21.5 lb-ft)

- Install the torque link bolt and tighten the nut.

Tightening torque	2.0–3.0 kg-m (14.5–21.5 lb-ft)

- Install the cotter pin into the torque link nut.
- When reconnecting the brake hose to the caliper body, be sure to point the hose in the direction shown to keep the hose away from other parts.

Tightening torque	1.5–2.5 kg-m (11.0–18.0 lb-ft)

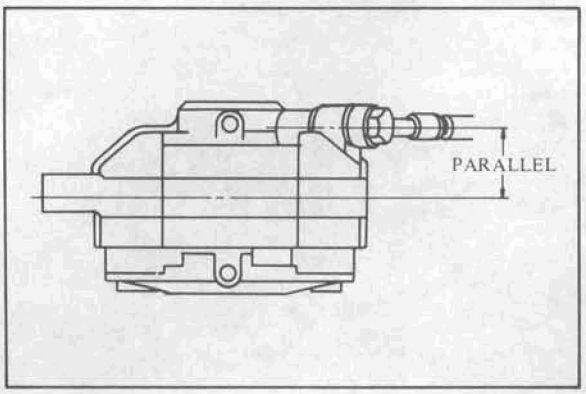


Fig. 11-99

IMPORTANT:
Most of the steps in reassembly of the front-brake caliper assembly are applicable also to the rear-brake caliper assembly.

- Remove the right frame cover.
- Remove the reservoir cap and supply brake fluid.
- Bleed air from the caliper and the oil hose.

AIR BLEEDING OF THE BRAKE FLUID CIRCUIT

- Refer to the procedure outlined in FRONT-BRAKE ASSEMBLY; the underlying principles are the same. Differences, however, due to the fact that the master cylinder is actuated by a pedal and that there are two bleeder valves. Bleed air from the inboard valve first, and then from the outboard valve.
- Operate the pedal in the way the brake lever is operated to drive air out. The pedal depressed will yield and go down as the fluid runs into the receptacle; in the case of the front brake, the lever touches the handlebar. When the pedal is about 40 mm (1.6 in) from the footrest when depressing, close the bleeder valve and release the pedal. Repeat the process of pumping and depressing the pedal until no air bubbles appear in the receptacle.

Bleeder valve tightening torque	0.6–0.9 kg-m (4.5–6.5 lb-ft)

Fig. 11-100

CAUTION:
As in the case of front-brake caliper assembly, it is essential that the air bleeding operation be carried out after restoring the rear brake system to the operating condition.

BRAKE PEDAL ADJUSTMENT

Adjust the pedal height in the following manner:

- Loosen lock nut ①. Loosen the return stopper bolt ② on the brake pedal.
- Loosen lock nut ③. Rotate the pushrod ④ to bring the pedal to a position 20 mm (0.8 in) below the top face of the footrest; and secure the pedal there by tightening nut ③.
- Adjust the clearance between pedal arm and return stopper to 0.5 mm (0.02 in.), and tighten lock nut ①.

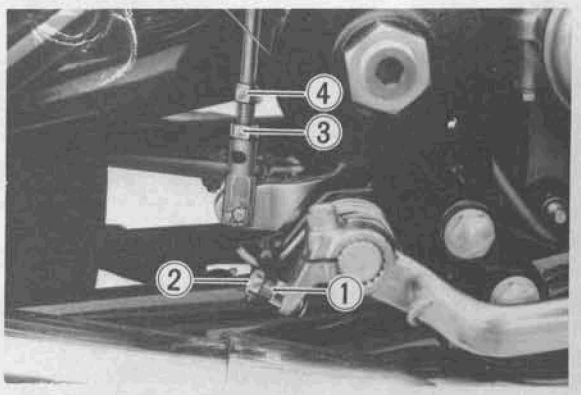
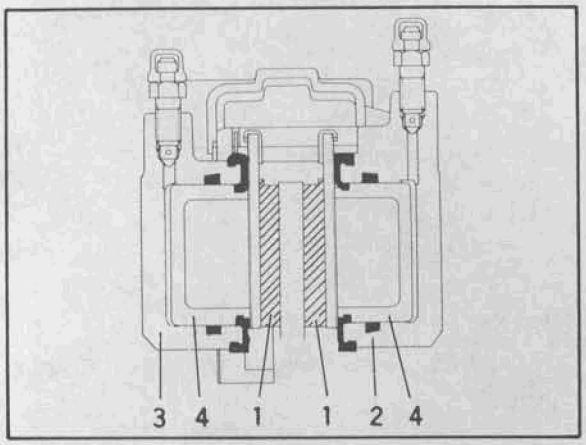


Fig. 11-101

PAD REPLACEMENT

- The pads can be replaced with the caliper assembly in place, by removing the pins supporting the pads and their stop pins and springs, but this method is not recommended because the piston boots might also come off and, it is almost impossible to accurately refit the boot when the assembly is in place. Reliable and accurate replacement is ensured by first removing the caliper assembly.

DISASSEMBLY OF REAR BRAKE CALIPER



1. Pad
2. Left caliper body
3. Right caliper body
4. Piston

Fig. 11-102

- Remove the pad inspection cap. Draw out the two pins ⑤ supporting each pad (a stop pin ⑥ must be pulled off first from the end of each pin ⑤). At the same time, remove the two springs ⑦ .

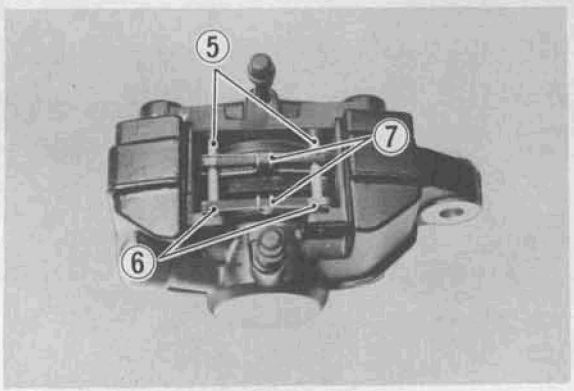


Fig. 11-103

- Remove the two bolts fastening the two caliper body halves together, and separate the two halves.

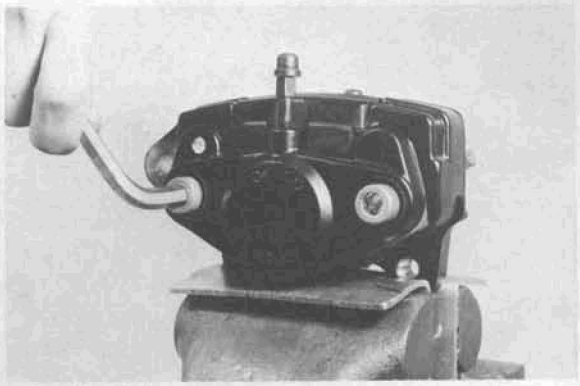


Fig. 11-104

- Remove the boot from each piston. Apply compressed air (2 kg/cm², 28 psi) to the internal fluid passage to force each piston out of the bores.

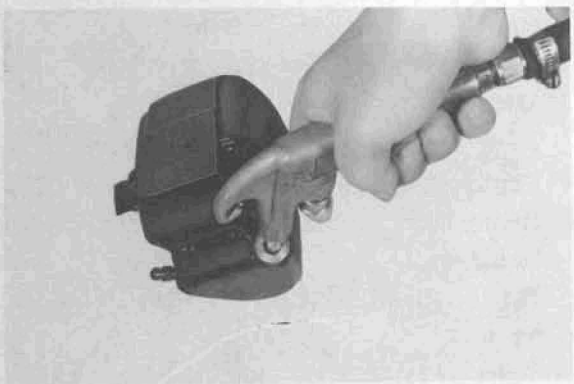


Fig. 11-105

INSPECTION

- Check brake pads for wear. Each pad is stepped at its edge to present two edge faces; one is painted red and the other is 1.5 mm (0.06 in) ① thick. The pad may be kept in service until this 1.5 mm (0.06 in) face disappears due to wear.

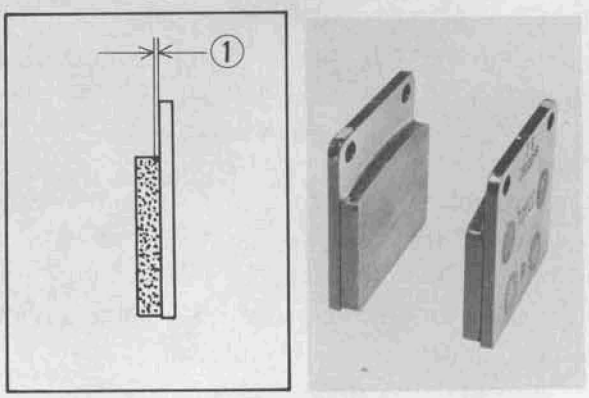


Fig. 11-106

ASSEMBLY

- Reassemble in the reverse order to disassembly paying attention to the following points.
- Wash the pistons, piston boots, rubber seal and caliper body halves with fresh brake fluid just before reassembling each part: reassemble while washing.

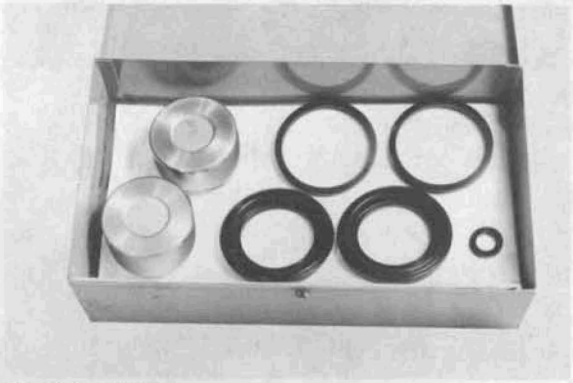


Fig. 11-107

- Fasten the two body halves together, tightening the two bolts to the torque specified below:

Tightening torque	2.5—3.5 kg-m (18.0—25.5 lb-ft)

- Fit a brake pad shim to the rear of the brake pad so that the "hole" in the shim points to the front.

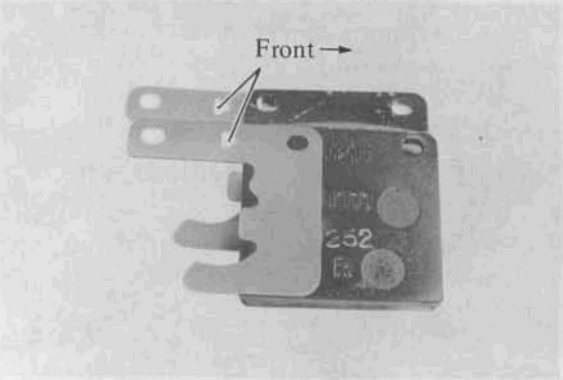
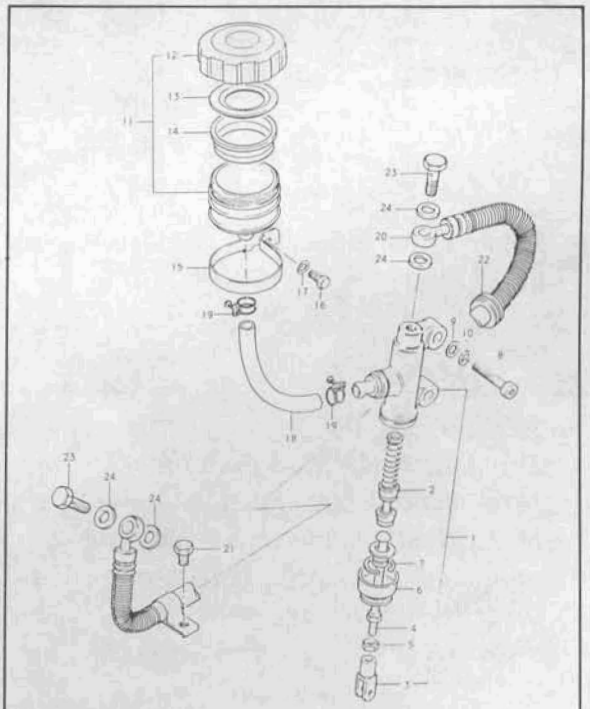


Fig. 11-108

- Insert the pin into the caliper body from the wheel side.
- Run the pin through the shims and pad into the opposite caliper body.
- Hook the two springs onto the lower part of the pin.
- While holding the springs with fingers, insert the other pin through the shims and pad into the caliper body.
- Set the stop pin into the pin hole.
- Place the inspection cap back on the brake pads.
- Bleed the air from the system as described in page 11-33.

REAR MASTER CYLINDER



1. Rear master cylinder assy
2. Piston & cup set
3. Yoke
4. Push rod
5. Nut
6. Boot
7. Circlip
8. Bolt
9. Washer
10. Lock washer
11. Reservoir tank assy
12. Cap
13. Diaphragm plate
14. Diaphragm
15. Clamp
16. Bolt
17. Lock washer
18. Hose
19. Clamp
20. Rear brake hose
21. Bolt
22. Grommet
23. Union bolt
24. Gasket

Fig. 11-109

REMOVAL

- Pull off split pin ① from the lower end of pushrod, and disconnect the master cylinder rod from the brake pedal arm.
- Remove the right frame cover.

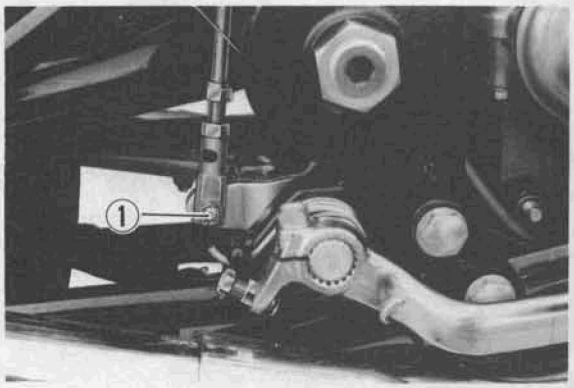


Fig. 11-110

- Remove the union bolt ① securing the brake hose.

NOTE:
Drain the brake fluid from the reservoir beforehand. Exercise care to prevent the brake fluid coming in contact with the motorcycle frame. If any brake fluid touches the frame, wipe it off immediately with a rag.

- Remove the two bolts ② securing the master cylinder to the frame, and lower the cylinder.

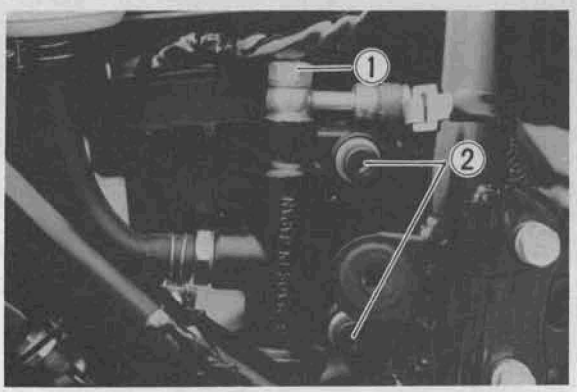


Fig. 11-111

- Remove bolt ① securing the reservoir and remove the reservoir from the frame.

Fig. 11-112

- Remove the master cylinder by lifting it up.

MOUNTING

- Fasten the reservoir with one bolt.
- Insert the cylinder master rod into the brake arm.
  Fasten the master cylinder with two bolts.

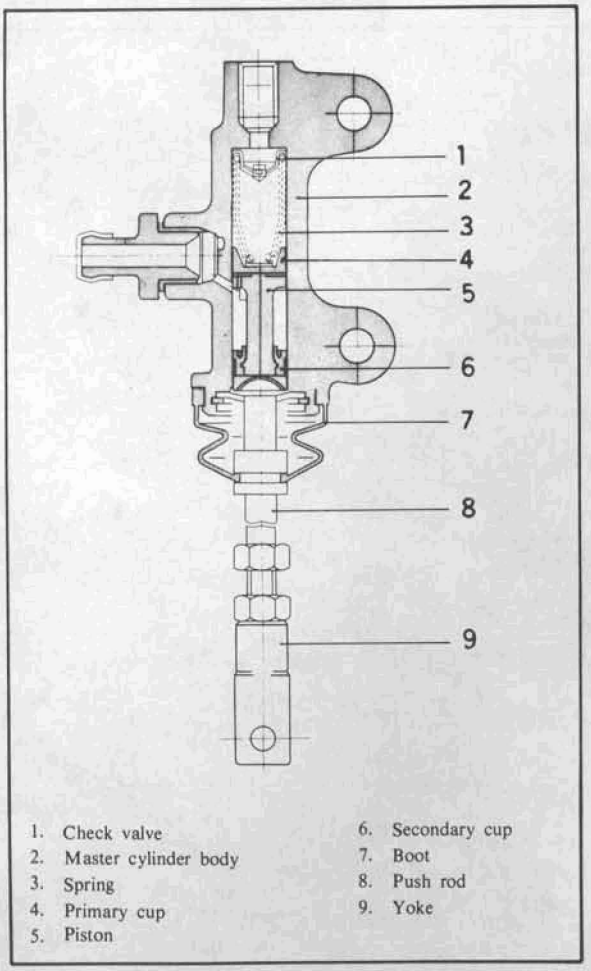
Tightening torque	1.5—2.5 kg-m (11.0—18.0 lb-ft)

- Position the master cylinder rod and the brake arm with the pin and secure them with a split pin.

NOTE:
Insert the pin from the left side, insert a washer and connect the rod to the arm through the split pin.

- Carry out air bleeding indicated previously. (See page 11-33).
- Adjust the brake pedal height as indicated previously. (See page 11-33).

DISASSEMBLY OF MASTER CYLINDER



1. Check valve
2. Master cylinder body
3. Spring
4. Primary cup
5. Piston
6. Secondary cup
7. Boot
8. Push rod
9. Yoke

Fig. 11-113

- Loosen the clip screw on the master cylinder side and extract the brake hose from the master cylinder.
- Take off the boot, and take out the circlip using special tool ①.

Snap ring pliers	09900-06105

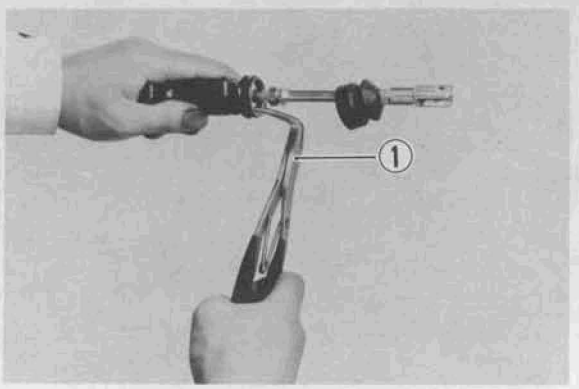


Fig. 11-114

- Take out the piston, check valve, coil spring and primary cup from the cylinder.

NOTE:
Using a piece of wood or soft-metal, push these internal parts out of the cylinder bore, taking care not to nick or scratch the bore wall. Be careful, too, not to damage the parts.

INSPECTION

- Inspect the primary cup and boot for wear and damage and, if necessary, replace them.

ASSEMBLY

Reassemble the master cylinder in the reverse order to disassembly with the following additional steps:

- Be sure to apply brake fluid to the cylinder bore and all the internal parts to be inserted into the bore.
- Assemble the check valve, coil spring and primary cup outside the cylinder, and insert the assembly into the bore, taking care not to unseat the coil spring off the check valve. Remember that the spring can easily come off the valve. Be careful not to allow the primary cup to cock inside the bore.

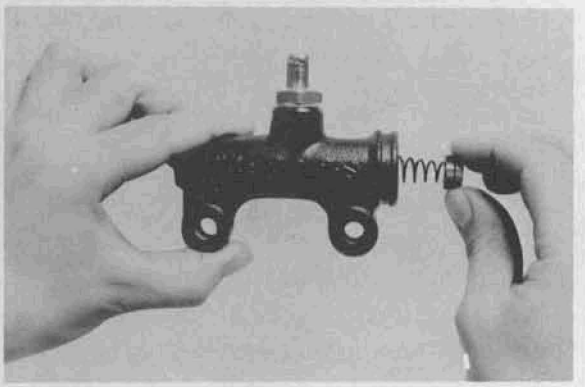


Fig. 11-115

- It is advisable to replace the primary cup unless the cup removed in disassembly is in perfect condition.

CAUTION:
Always install the circlip with the sharp edge away from the spring.

- After fitting the circlip, try to turn it in place to make sure it is snugly seated in the groove. Use of a new circlip is advisable instead of re-using the one removed in disassembly.

BRAKE PARTS TO BE PERIODICALLY REPLACED

Brakes are critical safety components which must be maintained in peak condition at all times. In view of this requirement, the following brake parts of the Model GS850G should all be simultaneously replaced at intervals of two years.

The parts named are subject to wear or deterioration but may continue to work satisfactorily beyond the two-year interval. Experience, however, tells that replacement after each two years is justified from standpoints of safety and economy. Adherence to this rule is strongly recommended.

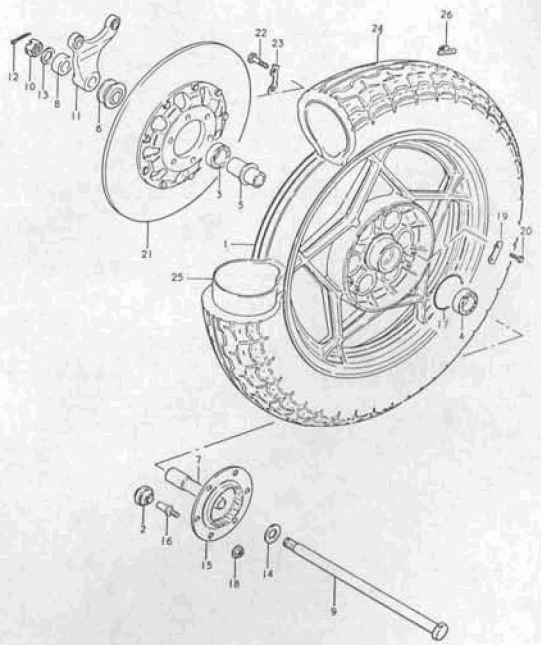
Replacement interval: Two years

- Components of master cylinder assembly (Use Suzuki Genuine parts: Master cylinder cup set)
- Component of caliper assembly (Use Suzuki Genuine parts: Pad and piston set)

NOTE:
Pad and piston set includes two kinds of grease packed in pouch. Grease in the pouch printed "Caliper Axle Grease" should be used for the caliper axle and printed "Brake Pad Grease" for the pad No. 1.

CAUTION:
Be sure to wash all component parts in the above sets with clean brake fluid before installing them into the master cylinder or caliper.

REAR WHEEL



1. Rear wheel set
2. Cushion
3. Bearing, RH
4. Bearing, LH
5. Bearing spacer
6. Spacer, RH
7. Spacer, LH
8. Spacer, RH
9. Rear axle
10. Nut
11. Rear caliper bracket
12. Cotter pin
13. Washer
14. Washer, LH
15. Driven joint
16. Bolt
17. O ring
18. Nut
19. Washer
20. Bolt
21. Rear brake disk
22. Bolt
23. Washer
24. Rear tire
25. Inner tube
26. Balancer

Fig. 11-116

REMOVAL

- Place the motorcycle on level ground and place the motorcyle on the center stand.

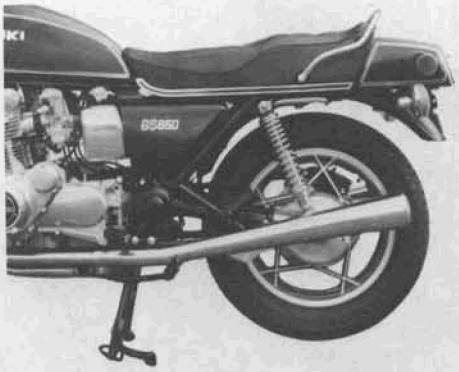


Fig. 11-117

- Insert a phillips head screwdriver into the right side of the center stand pivot to prevent the motorcycle from falling off the center stand.

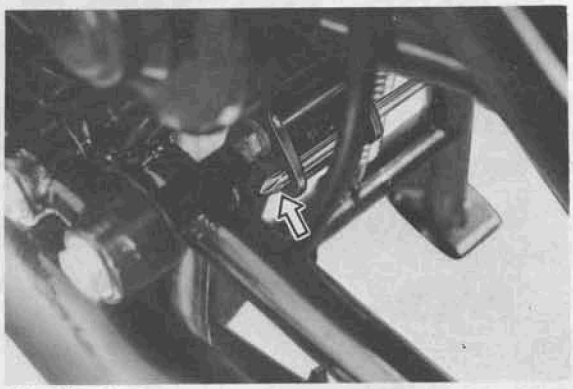


Fig. 11-118

- Remove the upper shock absorber nuts and pull the top side of the shock absorbers free from the mounting lugs. This will allow the swing arm/differential to be easily moved.

> *CAUTION:*
> *Take care not to burn yourself if the mufflers are hot.*

- Lift the swing arm/differential up by attaching the 14 mm wrench to one of the caliper bolts and use the wrench as a lift handle. While lifting the swing arm/differential insert the socket wrench handle through the right muffler support and swing arm hole. This will hold the swing arm in the best position for removing the rear wheel axle.

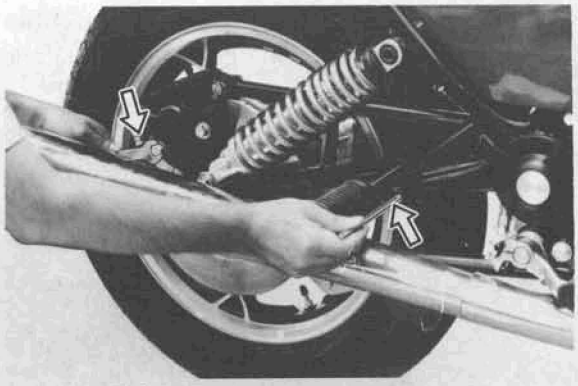


Fig. 11-119

Fig. 11-120

- Remove both right and left rear shock absorbers.
- Remove the rear torque link cotter pin, bolt, nut and support bolt of the brake hose.
- Remove the axle cotter pin and axle nut.

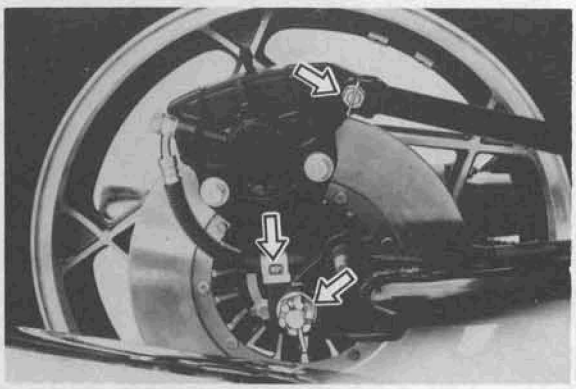


Fig. 11-121

- Remove the axle, while at the same time supporting the caliper assembly. After the axle is clear of the caliper, hang the caliper on the upper shock absorber mount stud.

> *CAUTION:*
> *Do not allow the brake hose to touch a hot muffler. Protect it by wrapping the hose in a rag.*

- Remove the axle from the differential housing. Remove the wheel from the splined drive and set the wheel assembly on the ground.

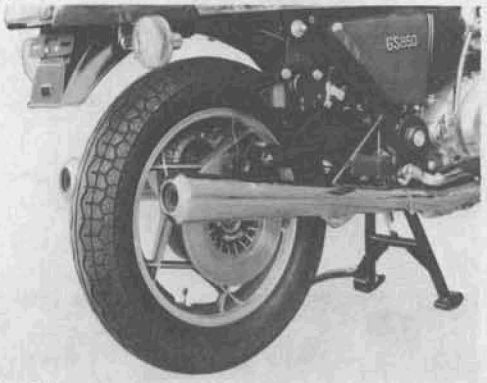


Fig. 11-122

- The front forks must be compressed in order to tilt the back of the motorcycle up so that the tire can be removed from the fender well area. Depress the front fork filler valves to remove all air pressure from the system. Remember to bleed pressure off slowly. To compress the forks turn the forks to the right fork stopper. Hang the front fork compressing tool hook ① on the left front fender boss. Hang wire loop ③ on the left fork stopper. Pivot the front fork compressing tool handle to compress the forks, then position hook ② on the tool lever handle to hold the forks in the compressed position.

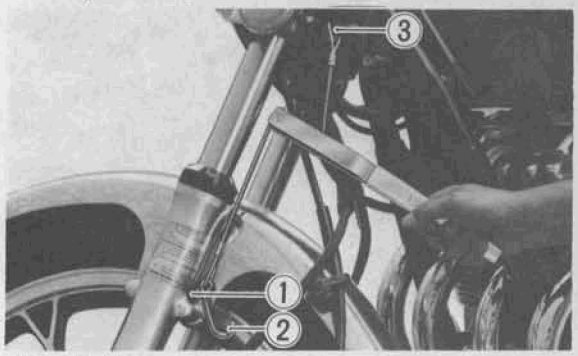


Fig. 11-123

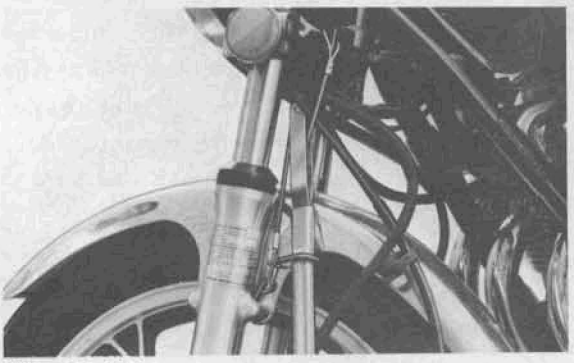


Fig. 11-124

- Remove the rear wheel assembly.

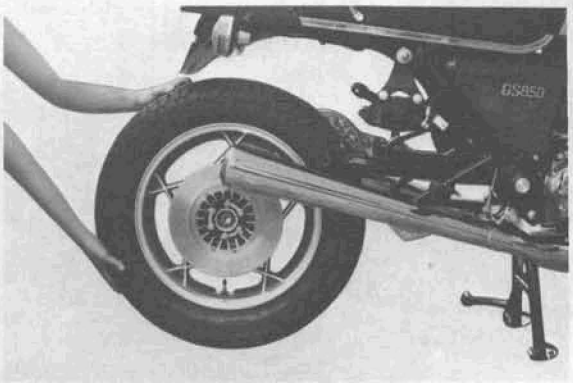


Fig. 11-125

- The brake disk is secured to the wheel hub by 6 bolts, each being locked with a washer. Bend up the lock washer, remove the bolts and separate the disk from the wheel.

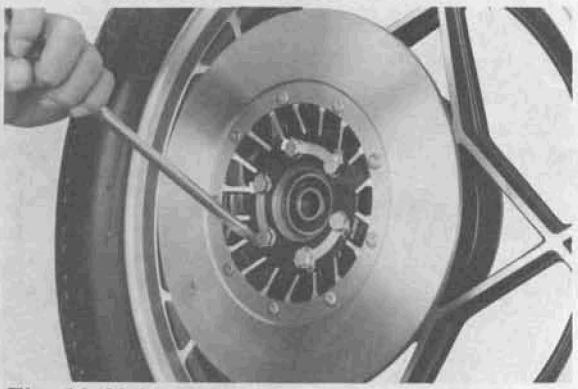


Fig. 11-126

- Straighten the washer tongues bent over the six nuts, remove the nuts and remove the driven joint from the wheel.

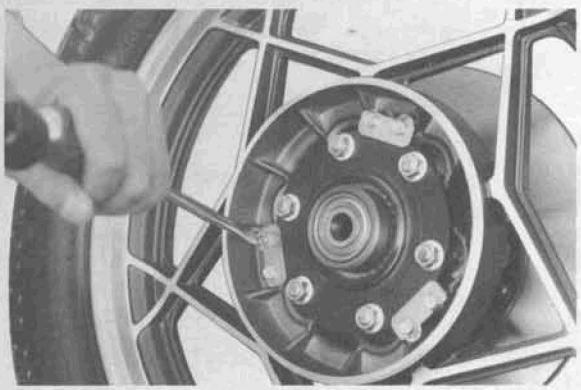


Fig. 11-127

- Remove the six bolts from the bushings.
- Remove the bearing.

INSPECTION

- Using a micrometer check the disk for wear. The thickness can be checked with disk and wheel in place. The thickness limit of the disk is specified below:

Rear brake disk thickness

Standard	Service Limit
6.5–6.9 mm (0.26–0.27 in)	Under 6.0 mm (0.24 in)

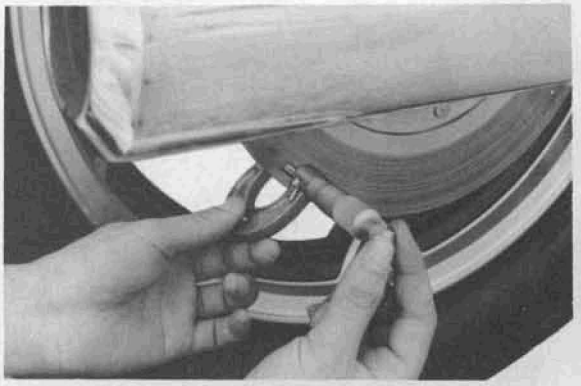


Fig. 11-128

- Reinstall disk on hub.

Tightening torque	2.0–3.0 kg-m (14.5–21.5 lb-ft)

- With the disk mounted on the wheel, check the disk for face runout with a dial gauge, as shown.

Rear brake disk runnout

Service Limit	0.3 mm (0.012 in)

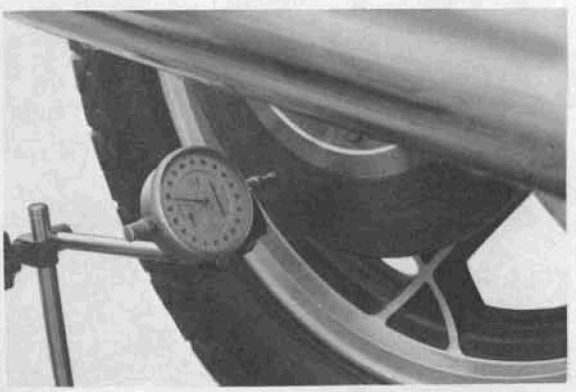


Fig. 11-129

- Using a dial gauge, check the axle shaft for runout and replace it if the runout exceeds the limit.

Rear axle runout

Service Limit	0.25 mm (0.010 in)

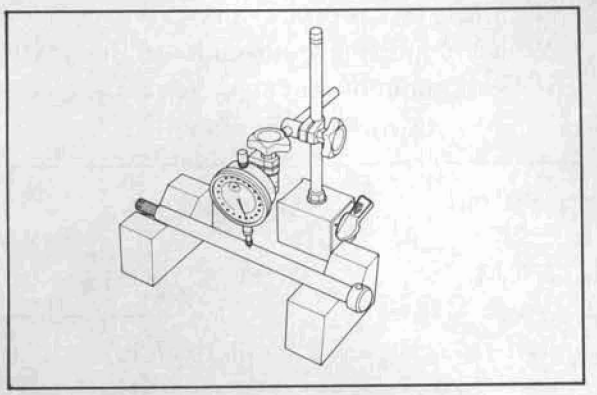


Fig. 11-130

- Inspect the tire for wear and damage, and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with its tread worn down to the limit (in terms of tread depth) must be replaced.

Rear tire tread depth

Service Limit	2.0 mm (0.08 in)

Fig. 11-131

- Check the tire pressure, and examine the valve for evidence of air leakage.
- Check the wheel for axial and radial runout. For the former runout, apply the dial gauge spindle horizontally to the rim; for the latter, point the spindle radially to the inner surface of the rim.
- While supporting both ends of the shaft inspect runout of the rim with a dial gauge.

Rear wheel rim runout

Runout	Service Limit
AXIAL	2.0 mm (0.08 in)
RADIAL	2.0 mm (0.08 in)

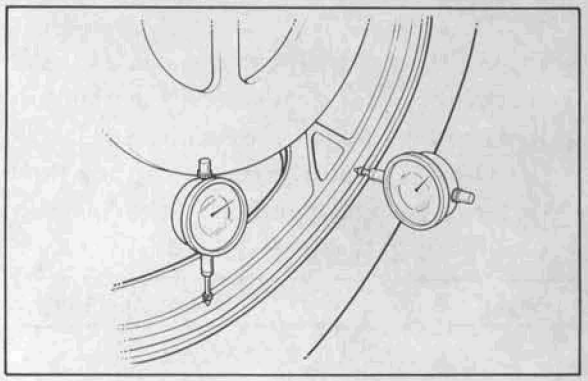


Fig. 11-132

- Spin the wheel (complete with the brake disk) to check dynamic balance. Use a 20-gram or 30-gram balancing piece, as necessary. Spin the wheel several times and make sure that the wheel comes to a natural halt not in a particular position but in random positions each time.

Wheel balancer

Weight	Part Number
20 grams (0.04 lbs)	55411-45100
30 grams (0.07 lbs)	55412-45100

IMPORTANT:
Remember that the wheel will not be balanced when the tire is replaced or repaired after a puncture: the wheel must be rebalanced each time its mass is altered.

Fig. 11-133

ASSEMBLY

- Insert the rear wheel assembly under the rear fender well area.
- Remove the front fork compressing tool from the front fork.
- Fit the wheel assembly back onto the splined engagement shaft. Insert the axle through to the right side of the swinging arm. Install and tighten the axle nut securely. Fit the cotter pin in the axle nut.

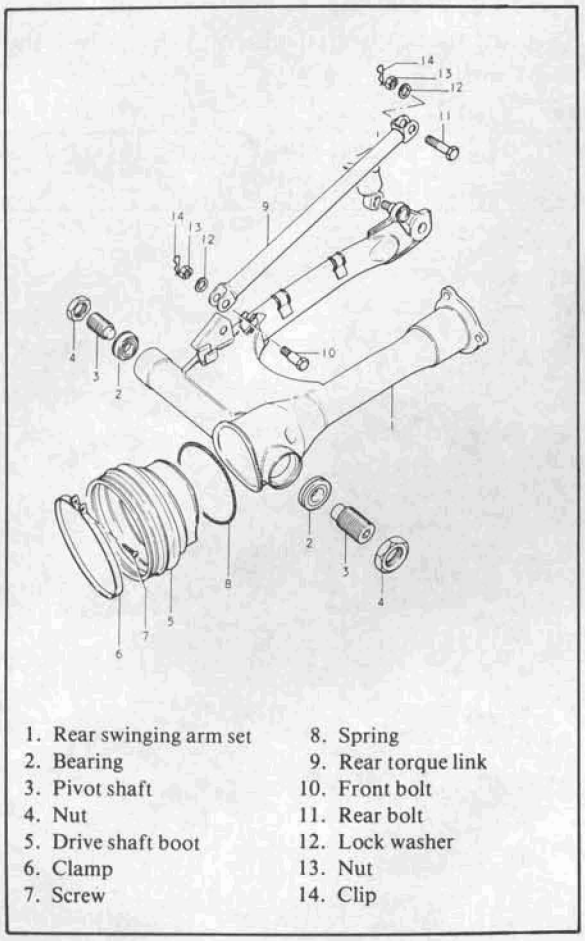
CAUTION:
When reinstalling the rear caliper be careful not to twist the brake hose or route it improperly. Never depress the brake pedal with the rear wheel removed as it is very difficult to force the brake pads back into the caliper assembly.

- Install the rear torque link in the caliper assembly. Remember to reinstall the cotter pin after tightening the bolt and nut.
- Remove the socket wrench handle and replace the shock absorbers. Tighten their securing nuts to specification below.
- Remove the screwdriver from the center stand pivot.

Tightening torque

Rear axle shaft nut	8.5–11.5 kg-m (61.5–83.0 lb-ft)
Torque link nut	2.0–3.0 kg-m (14.5–21.5 lb-ft)
Rear shock absorber nut	2.0–3.0 kg-m (14.5–21.5 lb-ft)

REAR SWINGING ARM



1. Rear swinging arm set
2. Bearing
3. Pivot shaft
4. Nut
5. Drive shaft boot
6. Clamp
7. Screw
8. Spring
9. Rear torque link
10. Front bolt
11. Rear bolt
12. Lock washer
13. Nut
14. Clip

Fig. 11-134

REMOVAL

- Remove the rear wheel (See page 11-39)
- Remove the brake hose from the clamp on the swinging arm, tie the rear brake caliper with a string and hook it on to the frame.

CAUTION
Be careful not to bend or twist the brake hose.

- Remove the final drive gear assembly.
- Remove the ring holding the secondary boot and slide the boot to the other side.
- Remove the rear stop light switch.
- Pull of the cotter pin from the master cylinder pushrod.
- Remove the rear swinging arm nuts ① and loosen the pivot shafts ② .

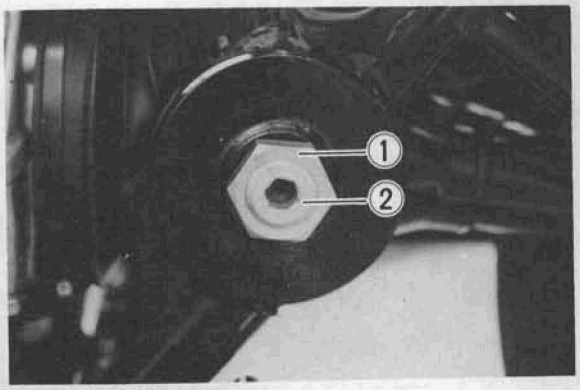


Fig. 11-135

- Pull the rear swinging arm rearward and remove it from the frame.

CAUTION:
When removing the rear swinging arm, the inner roller bearing on both right and left sides could easily fall off the bearing. Exercise care to prevent this happening.

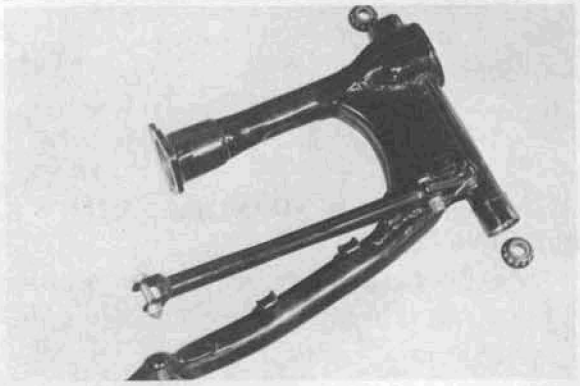


Fig. 11-136

MOUNTING

- Install both inner roller bearings, to the rear swinging arm and install the rear swinging arm on the frame.
- Tighten both pivot shafts to specification.

Pivot shaft tightening torque	0.35–0.45 kg-m (2.5–3.0 lb-ft)

CAUTION:
The gaps between the frame and rear swinging arm should be even.

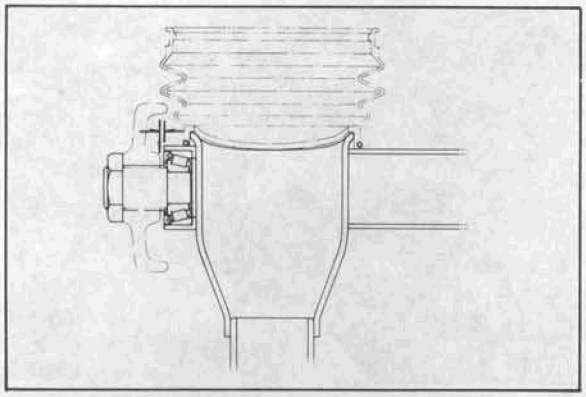


Fig. 11-137

- Tighten both lock nuts to specification.

Nut tightening torque	11.0–13.0 kg-m (79.5–94.0 lb-ft)

- Install the secondary boot.
- Install the final drive bevel gear assembly. (See page 8-14.)
- Install the rear stop light switch.
- Mount the rear wheel. (See page 11-42.)

DISASSEMBLY OF SWINGING ARM BEARING

- Using special tool ①, remove the bearing outer races, both right and left, from the swinging arm.

①	Bearing and oil seal remover	09941-64510

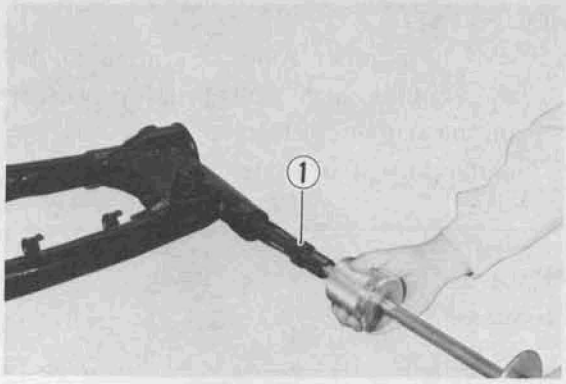


Fig. 11-138

MOUNTING

- Using special tool ②, force-fit the bearing outer races, both right and left, into the swinging arm.

②	Bearing and oil seal handle	09924-74510

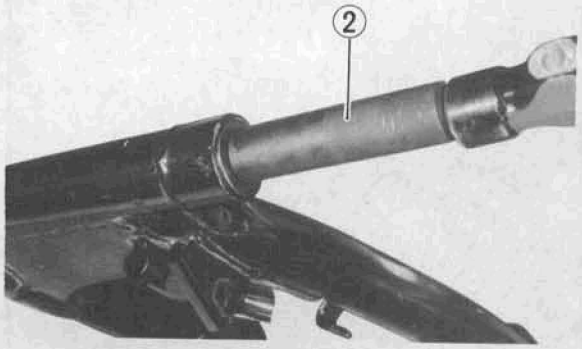


Fig. 11-139

REAR SHOCK ABSORBER

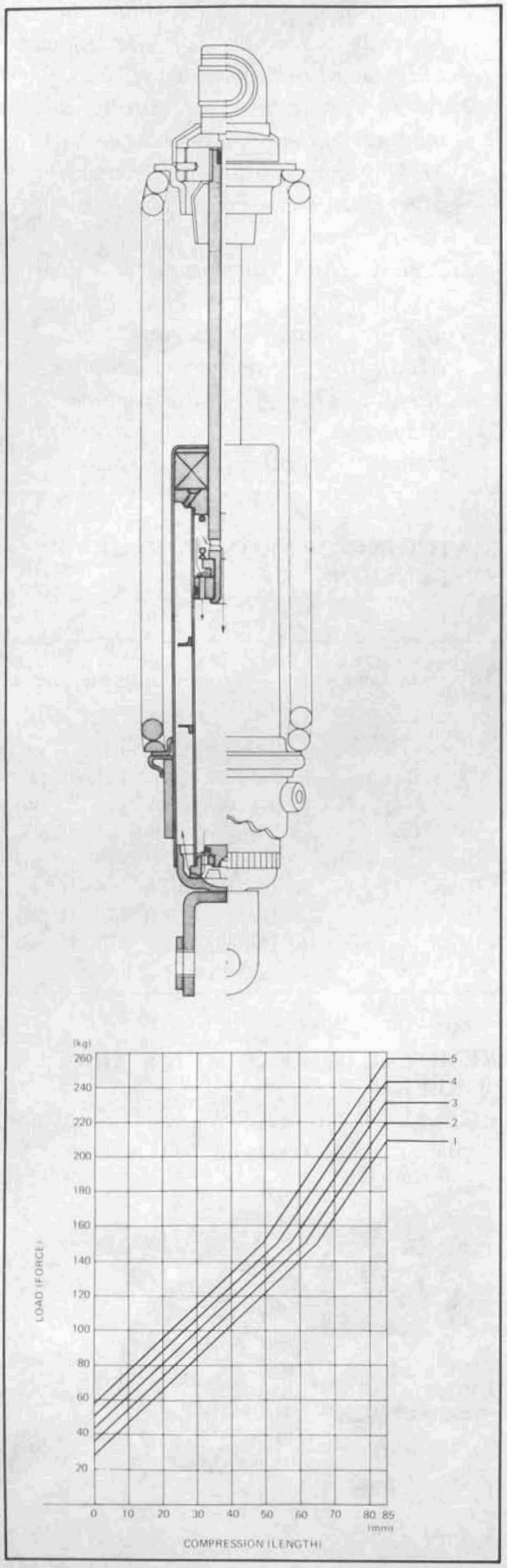


Fig. 11-140

REAR SHOCK ABSORBERS

- The spring and damper settings of the rear shock absorbers can be varied. Spring preload can be changed in five steps, and damper force in four steps. The two settings provide the user with a choice of rear suspension "softness" to suit running speed and road conditions.

SPRING ADJUSTMENT

- At the bottom of each absorber, turn the spring seat, as shown in the photo, to bring the other notch to the supporting lug. This alters spring tension. The spring seats of both absorbers are factory-set at Notch 1 which is the softest spring setting.

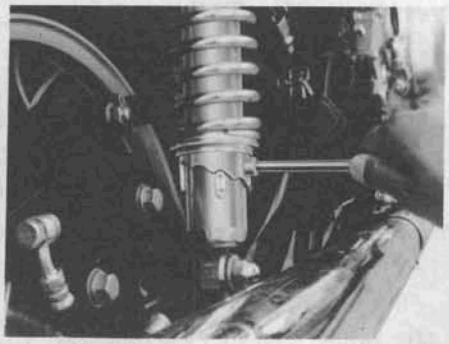


Fig. 11-141

DAMPER ADJUSTMENT

- Roll up rubber cap ① at the top end of each absorber to reveal damper force adjuster ②. To increase or decrease the damper force, turn this adjuster as shown in the photo. Numbers, 1 to 4, are engraved on the adjuster. As the adjuster is turned, it is arrested with a "click" at each numbered position.

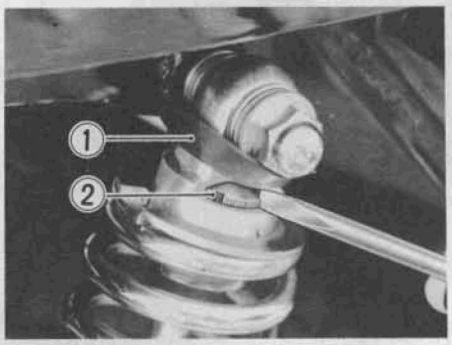


Fig. 11-142

Be sure to leave the adjuster in a click position. Position 1 is for the smallest damper force, and position 4 for the largest. Position 1 is the factory setting.

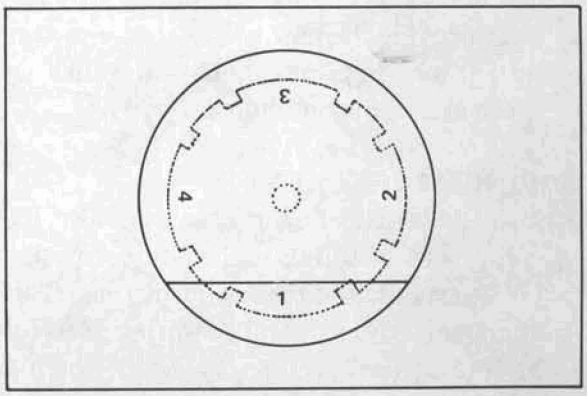


Fig. 11-143

COMBINATIONS OF SPRING SETTING AND DAMPER SETTING

- At the factory, both spring and damper in the rear shock absorbers are set for the "softest" suspension, that is, spring in Notch 1 and damper in Position 1. This combination is calculated to provide the best cushioning effect for the average-build rider of 68 kg (150 lbs) for solo riding at about 60 miles/h (95 km/h) on the highway, without any accessories attached to the motorcycle.
- Rear shock absorber must be made "harder" if two persons on the motorcycle, if accessories are fitted to the motorcycle, or if the machine is to be driven over rough terrain. For stable cushioning, both spring and damper must be set similarly. The following is a list of recommended combinations:

Spring setting	Damper setting
I	1 or 2
II	2 or 3
III	3 or 4
IV	3 or 4
V	4

WARNING:

1) Any other combination than those above is dangerous. For safe riding, only use the recommended settings.

2) Be sure to adjust the springs and dampers of the two absorbers equally. Making one absorber harder than the other disturbs the running stability of the machine.

3) Match front suspension to rear suspension for balanced cushioning and for stable and safe riding. Readjusting the rear shock absorbers alone or the front fork alone is dangerous. Set the two suspensions similarly according to the list below.

MATCHING OF FRONT AND REAR SUSPENSIONS

Spring setting	Damper	Front fork air pressure
I	1	0.6–0.8 kg/cm² (8.5–17 psi)
I	2	0.8–0.9 kg/cm² (11–13 psi)
II	2	0.8–0.9 kg/cm² (11–13 psi)
II	3	0.8–0.9 kg/cm² (11–13 psi)
III	3	1.0–1.1 kg/cm² (14–16 psi)
III	4	1.0–1.1 kg/cm² (14–16 psi)
IV	3	1.0–1.1 kg/cm² (14–16 psi)
IV	4	1.0–1.1 kg/cm² (14–16 psi)
V	4	1.2 kg/cm² (17 psi)

REMOVAL OF REAR SHOCK ABSORBER

- Locate the motorcycle on level ground and place the motorcycle on the centerstand.

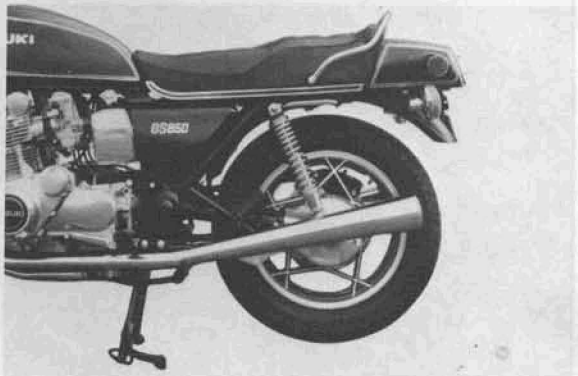


Fig. 11-144

- Insert the crosshead screwdriver into the right side of the centerstand pivot to prevent the motorcycle from tipping off the centerstand.

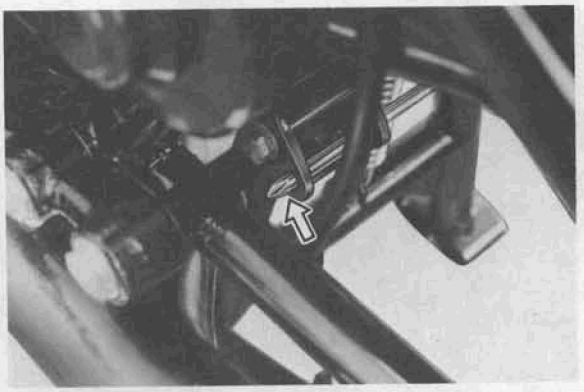


Fig. 11-145

- Remove the upper shock absorber nuts and pull the top side of the shock absorbers free from the mounting lugs. This will allow the swing arm/differential to be easily moved.

CAUTION:
Take care not to burn yourself if the mufflers are hot.

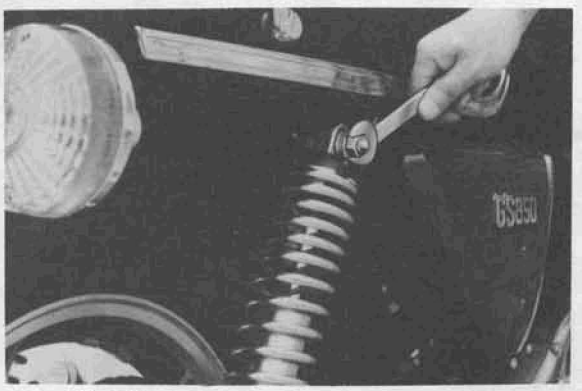


Fig. 11-146

- Lift the swing arm/differential up by attaching the 14 mm wrench to one of the caliper bolts and use the wrench as a lift handle. While lifting the swing arm/differential insert the socket wrench handle through the right muffler support and swing arm hole. This will hold the swing arm.

Fig. 11-147

Fig. 11-148

- Remove both right and left rear shock absorbers.

INSPECTION

- Inspect the hydraulic damper for evidence of oil leakage.
- Check the piston rod for distortion. Visually inspect all other internal parts for damage (cracks, dents, galling, etc.).

NOTE:
It is strongly recommended that the shock absorbers always be replaced as a set to insure proper balance between left and right units, unless the only one shock need be replaced and the operational time on the remaining shock is minimal.

ASSEMBLY

- Carry out assembly in the reverse order to removal.
- Tighten the nuts to the specified torque.

Rear shock absorber tightening torque	2.0—3.0 kg-m (14.5—21.5 lb-ft)

ELECTRICAL SYSTEM

CONTENTS

IGNITION SYSTEM 12- 2
SPARK PLUG 12- 3
CHARGING SYSTEM 12- 5
STARTER SYSTEM 12- 8
BATTERY 12-10
SELF-CANCELLING TURN SIGNAL SYSTEM 12-14
TROUBLE SHOOTING 12-15
UTILITY SWITCHES AND DEVICES 12-20
WIRE ROUTING 12-28
WIRING DIAGRAM 12-30

ELECTRICAL SYSTEM

IGNITION SYSTEM

There are two ignition coils, two contact breakers and two condensers to produce sparking energy for the four spark plugs. No. 1 breaker is for Nos. 1 and 4 spark plugs; and No. 2 breaker is for Nos. 2 and 3 spark plugs. Each ignition coil is connected to the plugs as shown.

When No. 1 piston is on its compression stroke, No. 4 piston is up on its exhaust stroke. The sparking occurring at the same time in Nos. 1 and 4 cylinders presents no problem, and the same applies to Nos. 2 and 3 cylinders. Ignition order is 1-2-4-3, counted from left to right by the rider mounted the machine. It should be noted that Nos. 1 and 2 breakers operate 180 degrees apart in terms of crank angle.

Schematic Diagram of Ignition System

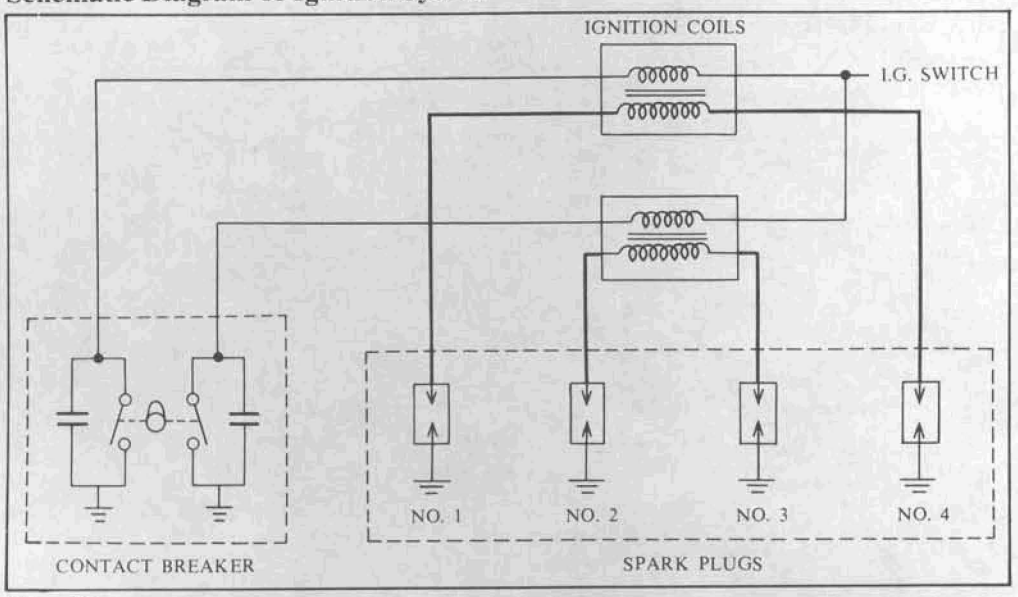


Fig. 12-1

Ignition system data

Spark Plugs:	
Type	NGK B8ES or DENSO W24ES
Gap	0.6 —0.8 mm (0.023—0.031 in)
Spark tester performance	8 mm (0.3 in) minimum
Contact Point Gap	0.3—0.4 mm (0.01—0.02 in)
Condenser Capacitance	0.18±0.02 μF
Spark Advancer:	
Advance angle	20°
Beginning of advance	1 500 r/min
End of advance	2 500 r/min
Ignition Coil Resistance:	
Primary	Approx. 4 Ω
Seconday	Approx. 15 kΩ

Ignition coils

Using the electro-tester, test each ignition coil for sparking performance. Test connection is as indicated. Make sure that the tester gap is at least 8 mm (0.3 in).

Electro tester (special tool)	09900-28106

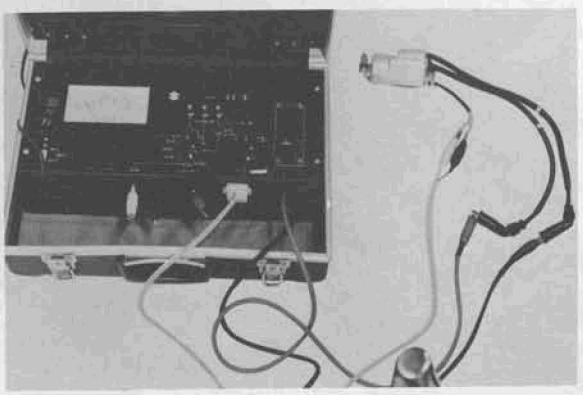


Fig. 12-2

Contact breakers

Check and adjust the contact points as outlined on page 3-9. Inspect the contact points for wear and burning. If the surfaces of the points are dirty, wipe them clean with a clean, dry cloth.

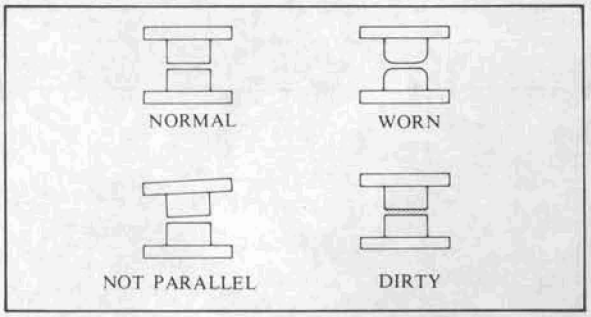


Fig. 12-3

Breaker cam

Check the contact breaker cam for wear, rust, or pits that might cause rapid wear of the breaker rubbing blocks.

Condensers

Use the electro-tester to check the condition of each condenser. When doing this, be sure to lift the condenser off the breaker base plate by removing the screws securing it to the base.

Condenser-capacitance	0.18 ± 0.02μF

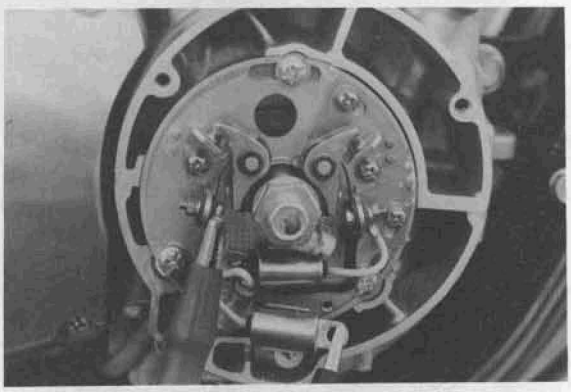


Fig. 12-4

Checking advancing action

Upon starting up the engine, check engine speeds at which the ignition begins to advance or retard, using the electro-tester (special tool):

Ignition timing	17° below 1 500 r/min 37° over 2 500 r/min
Timing light	09900-27311

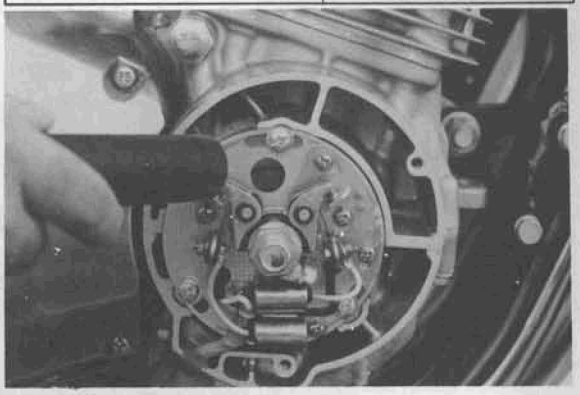


Fig. 12-5

SPARK PLUG

Spark plugs ignite the fuel/air mixture in the cylinder. For effective ignition at the required time, the correct plugs should always be used, and they should be properly adjusted and cleaned.

NGK	NIPPON DENSO	Remarks
B7ES	W22ES	If the standard plug is apt to get wet, replace with this plug. Hot type.
B8ES	**W24ES**	**Standard**
B9ES	W27ES	If the standard plug is apt to overheat, replace with this plug. Cold type.

NGK B8ES or NIPPON DENSO W24ES listed in the above table should be used as the standard plug. However the heat range of the plug should be selected to meet the requirements of speed, actual load, fuel, etc. If the plugs need to be replaced, it is recommended that ones having a heat range closest to the standard plug in the above table be selected.

Remove the plugs and inspect the insulators. Proper heat range would be indicated if all four insulators were light brown in color. If they are blackened by carbon, they should be replaced by a hot type NGK B7ES or NIPPON DENSO W22ES and if baked white, by NGK B9ES or NIPPON DENSO W27ES.

Plugs with high heat range number are used for high speed running. These plugs are designed to be sufficiently cooled to prevent overheating and are called cold type plugs.

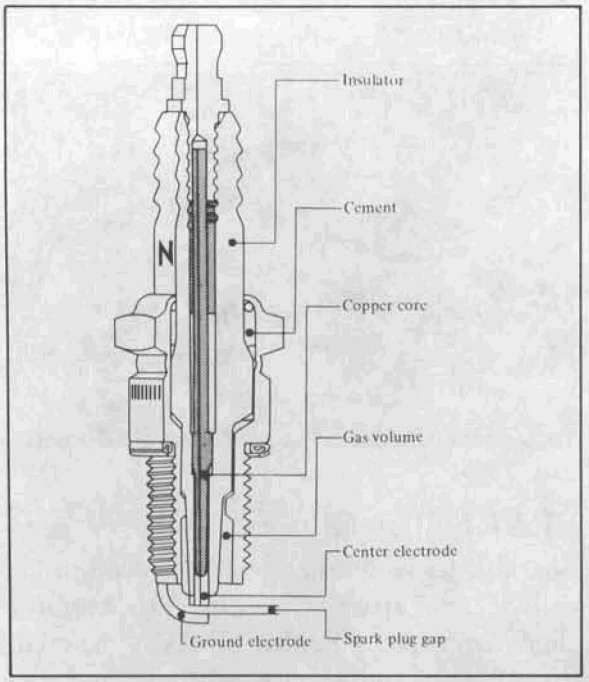


Fig. 12-6

The plug gap is adjusted to 0.6—0.8 mm (0.023—0.031 in). The gap is correctly adjusted using a thickness gauge (special tool). When carbon is deposited on the spark plug, remove the carbon with a spark plug cleaning machine or any tool with a pointed end. If electrodes are extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.

Thickness gauge	09900-20803

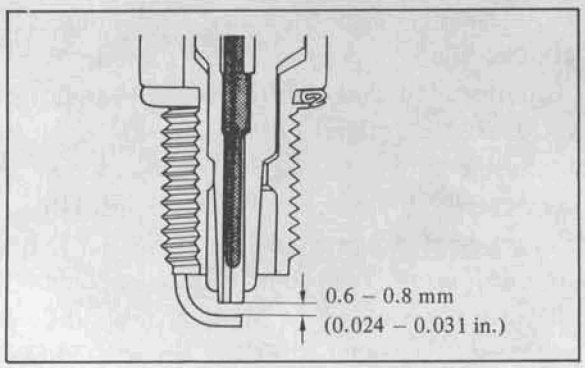


Fig. 12-7

CAUTION:
Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and the engine will be damaged.

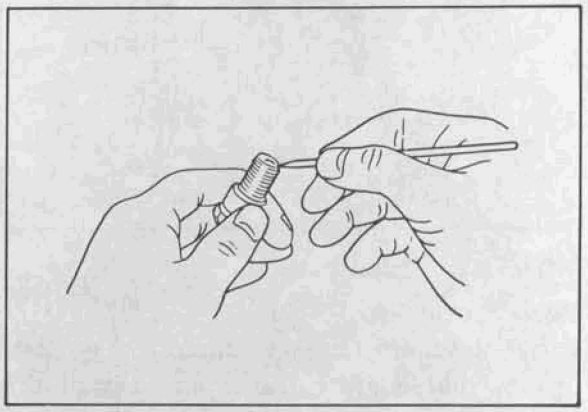


Fig. 12-8

Fig. 12-9 Normal carbon condition

Fig. 12-10 Overheating

Fig. 12-11 Wet fouling of plug

Fig. 12-12 Carbon stained

CHARGING SYSTEM

DESCRIPTION

A three-phase AC generator driven by the engine is used to supply alternating current through the regulator/rectifier to the battery. The alternating current from the generator is rectified in the regulator/rectifier and the rectified current is supplied to the battery when the battery voltage drops below the specification.

When the battery is fully charged and the specified voltage is reached, zener diode "Ze" conducts, switching SCR (thyristor) on and the current stops flowing to the battery and instead, flows to ground. In this way, the battery is protected from overcharging.

When the battery is discharged and the voltage becomes lower, the zener diode stops conducting and SCR is switched off. This prevents the current from flowing through the regulator and the current is supplied to the battery. The above operation is continuously repeated as the battery voltage rises and falls. In this way, the regulator-rectifier controls the flow of current to the battery.

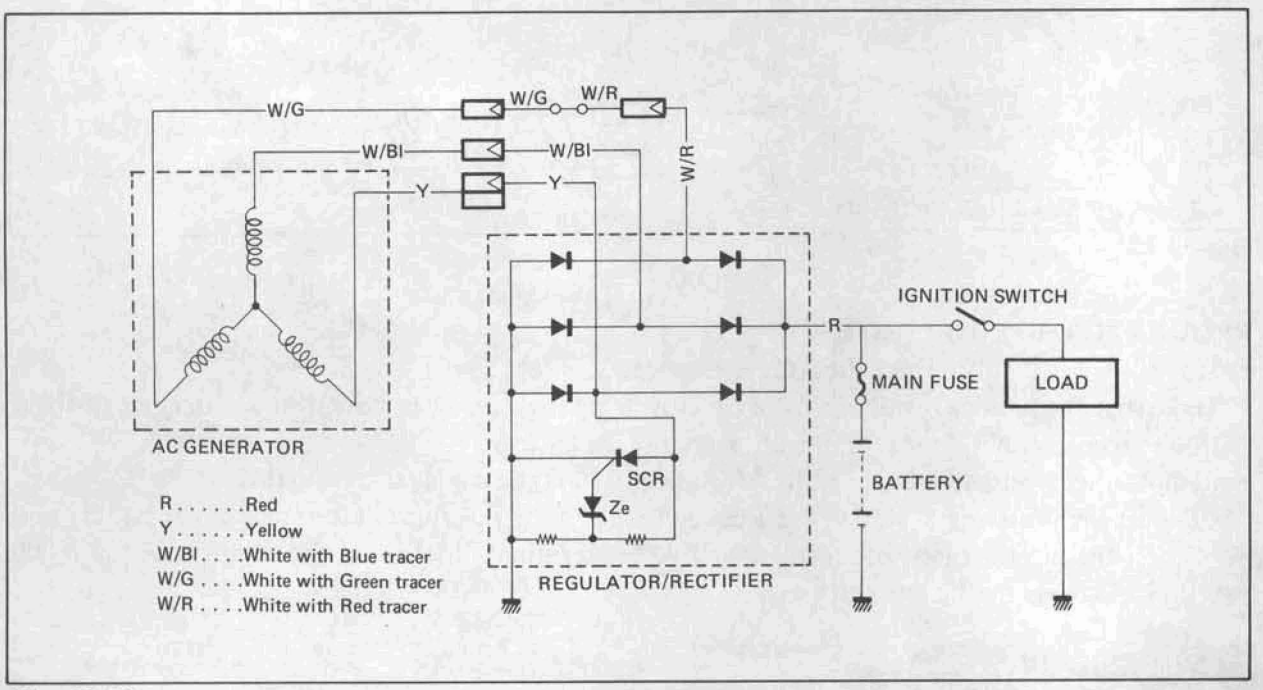


Fig. 12-13

CHARGING SYSTEM INSPECTION
AC GENERATOR TEST

- Disconnect the three lead wires (Y, W/G and W/B1) from the AC generator terminals.
- Start the engine and keep it running at 5 000 r/min. Measure the AC voltage between W/B1 and Y, W/B1 and W/G, and W/G and Y, using the Pocket Tester.

Pocket tester	09900-25002

Engine speed	AC line voltage	Electrical condition of AC generator
5 000 r/min.	75V or over	AC generator is satisfactory
	75V or under	AC generator is faulty

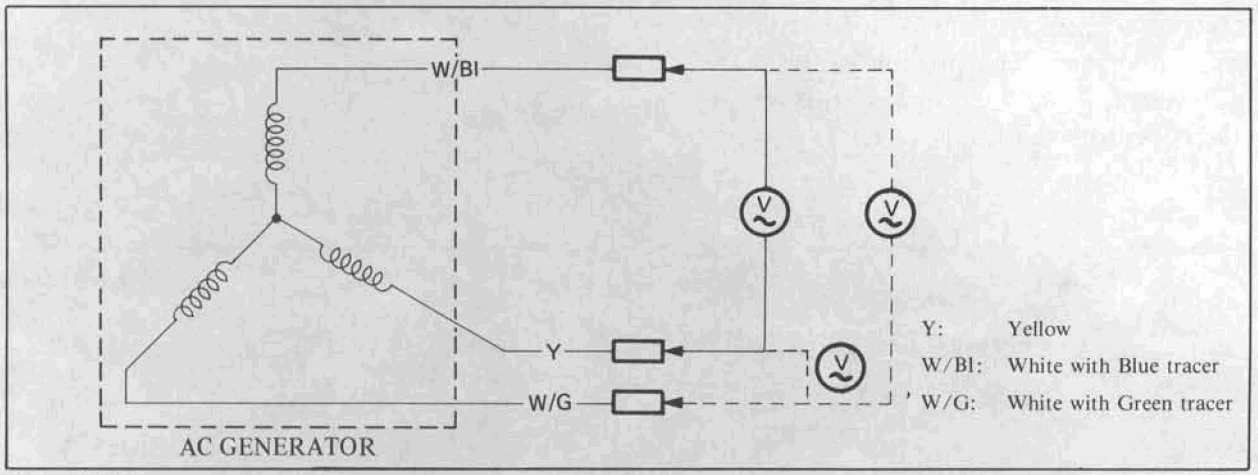


Fig. 12-14

REGULATOR/RECTIFIER TEST

- Stop the engine and connect the AC generator lead wires.
- Make sure the battery is fully charged by measuring the specific gravity of the battery electrolyte. If the specific gravity is less than 1.26, recharge the battery.
- Remove the two 10A fuses from the fuse box and start the engine under no load. Connect the positive (+) side of the Pocket Tester to the positive (+) terminal of the battery and connect the negative (−) side to the negative (−) terminal. Maintain the engine speed at 5 000 r/min and measure the DC voltage.

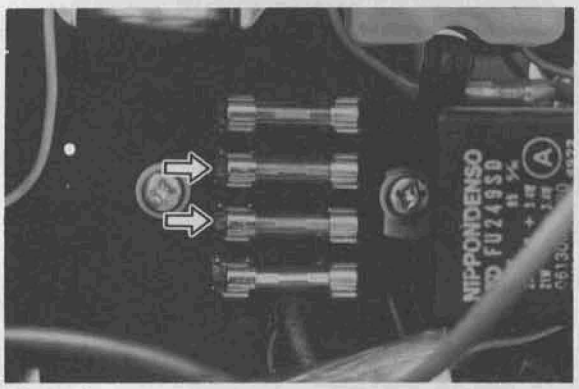


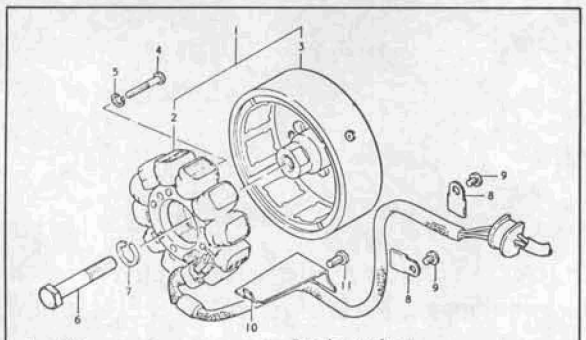
Fig. 12-15

Engine speed	DC line voltage	Electrical condition of Regulator/Rectifier
5 000 r/min	14V—15.5V	Regulator/Rectifier is satisfactory
	14V under or 15.5V over	Regulator/Rectifier is faulty

If the regulator is found to be faulty, check once again to be sure that the circuit connections are good, and again test the regulator as indicated above before deciding to replace it.

INSPECTION OF CHARGING SYSTEM COMPONENTS

AC GENERATOR



1. AC generator assy
2. Stator
3. Rotor
4. Screw
5. Lock washer
6. Bolt
7. Lock washer
8. Clamp
9. Screw
10. Clamp
11. Screw

Fig. 12-16

- Using the Pocket Tester, check continuity between the three lead wires (yellow, white with blue tracer, and white with green tracer) coming from the stator, and make sure that the stator core is insulated from these three lead wires.

Fig. 12-17

- If there is no continuity between the lead wires, replace the stator. Also replace the stator if there is continuity between any one of the leads and ground.

REGULATOR/RECTIFIER

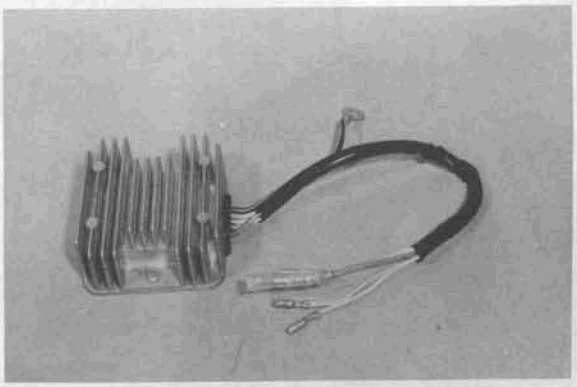


Fig. 12-18

The regulator-rectifier is comprised of a regulator and a rectifier.

- Check resistance between the lead wires using the Pocket Tester.
  If the resistance measured is incorrect, replace the regulator-rectifier.
  To make this checkup, refer to the charts below:

Pocket tester	09900-25002

Unit: Ω

		⊕ Prove of tester				
		R	W/BI	W/R	Y	B/W
⊖ Prove of tester	R		∞	∞	∞	∞
	W/BI	5–7		∞	∞	∞
	W/R	5–7	∞		∞	∞
	Y	5–7	∞	∞		∞
	B/W	30 – 40	5–7	5–7	5–7	

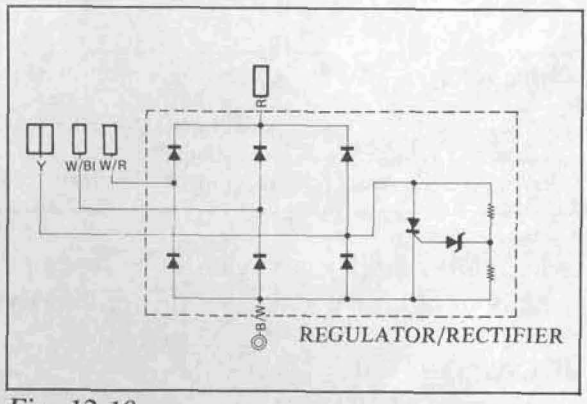


Fig. 12-19

R:	Red	W/BI:	White with Blue tracer
Y:	Yellow	W/R:	White with Red tracer
B/W:	Black with White tracer		

STARTER SYSTEM

The starter system is shown in the diagram below: namely, the starter motor, relay, starter switch and battery. Depressing the starter button (on the right handlebar grip) energizes the relay, causing the contact points to close which connects the starter motor to the battery. The motor draws about 80 amperes to start the engine.

STARTER SYSTEM DIAGRAM

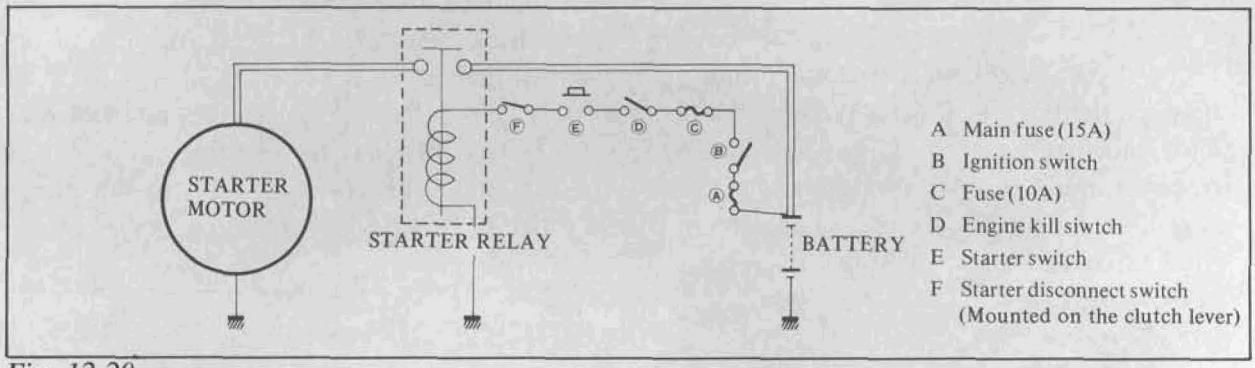


Fig. 12-20

STARTER CLUTCH AND GENERATOR ROTOR

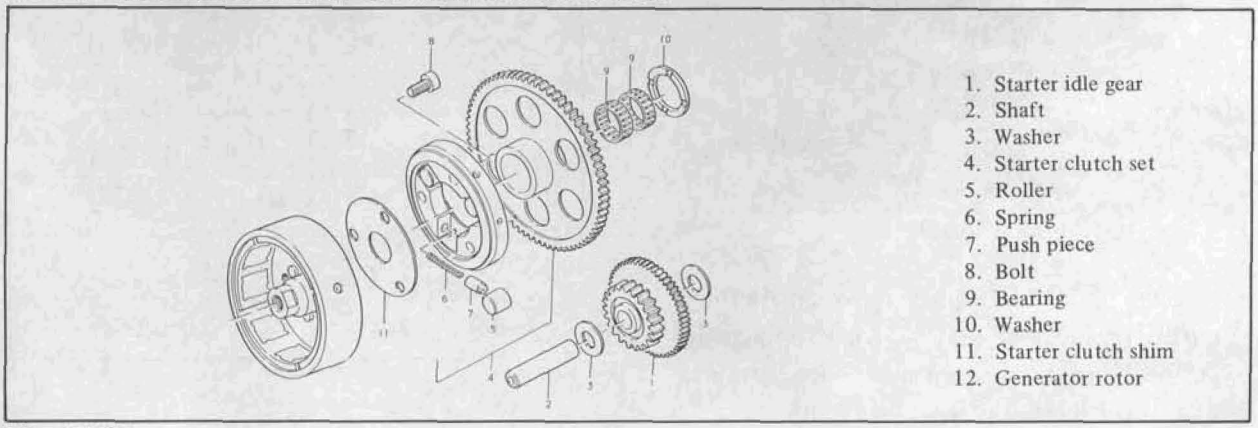


Fig. 12-21

• See page 7-32 for removal procedures of the rotor and starter clutch.

INSPECTION

Inspect the components to confirm that wiring connections are all tight and that the circuit wires are in good condition. Also make sure that each component is securely grounded.

When the system is in good condition, the starter relay will make a single chattering sound as the starter button is depressed and the motor will immediately crank the engine. If this chattering noise is not heard or if the starter motor fails to turn the engine over this means that either the relay is not being properly energized due to a run-down battery, or the relay coil is open.

If the relay "chatters" but the motor will not crank, then it is likely that the relay contact points are defective or the motor is internally open-circuited.

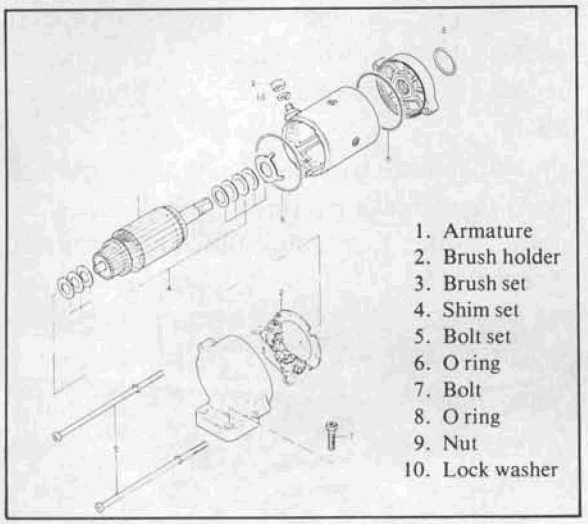


Fig. 12-22

Starter motor specifications

The motor is mounted on top of the crankcase behind the cylinder block, and drives the crankshaft through a series of gears and a one-way clutch which is mounted on the alternator rotor.

Item	No-load data	Locked-rotor data
Voltage	11 volts	5.5 volts
Current	50 amperes or under	280 amperes or under
Torque	—	0.35 kg-m or over
Speed	4 500 r/min or over	—

INSPECTION OF COMPONENTS

Carbon brushes

When the brushes are worn, the motor will be unable to produce sufficient current, and the engine will be difficult to turn over. To prevent this, periodically, inspect the length of the brushes, replacing them when they are too short or chipping.

Brush length specification	
Standard	Service limit
12—13 mm (0.47—0.51 in)	6 mm (0.24 in)

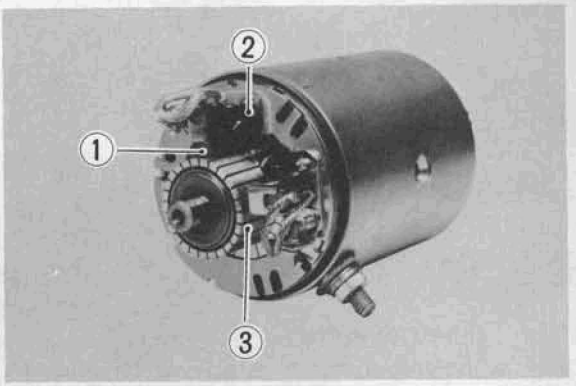


Fig. 12-23 ① Brush ② Brush springs ③ Commutator

Commutator

Inspect the commutator surface for wear, "high mica", burns or grooving. To smooth the surface, sand it down with sandpaper, as shown in armature coil. Undercut the mica to the depth ① specified.

Standard undercut	0.6 mm (0.023 in)
Limit on undercut	0.2 mm (0.008 in)

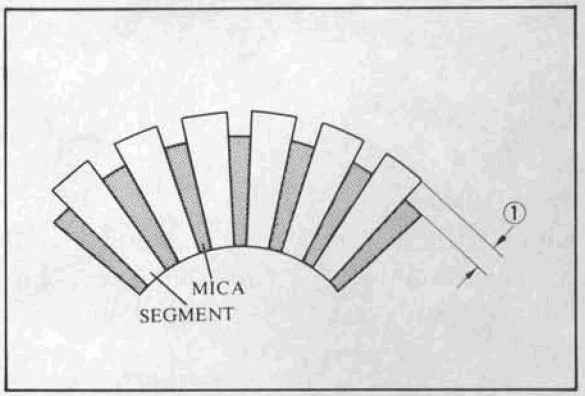


Fig. 12-24

Armature coil

Using a circuit tester, check the coil for open and ground by placing probe pins on each commutator segment and rotor core (to test for ground) and on any two segments at various places (to test for open), with the

brushes lifted off the commutator surface.
If the coil is found to be open-circuited or grounded, replace the armature. Continued use of a defective armature will cause the starter motor to suddenly fail.

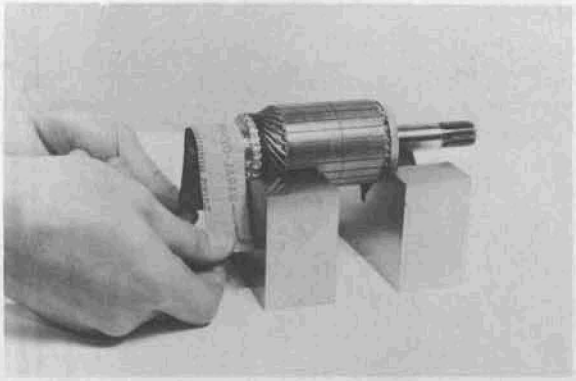


Fig. 12-25

Relay for starter motor

This relay acts as a solenoid switch and, as such, it is necessary for the coil, contact plunger and contact points to be in good condition. It should be borne in mind that the contact points have to transmit a large current to the starter motor.

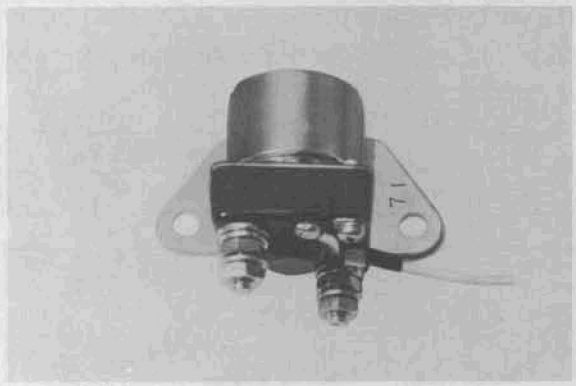


Fig. 12-26

Check the coil for "open", "ground" and ohmic resistance. The coil is in good condition if the resistance is 3.0—4.0 ohms.

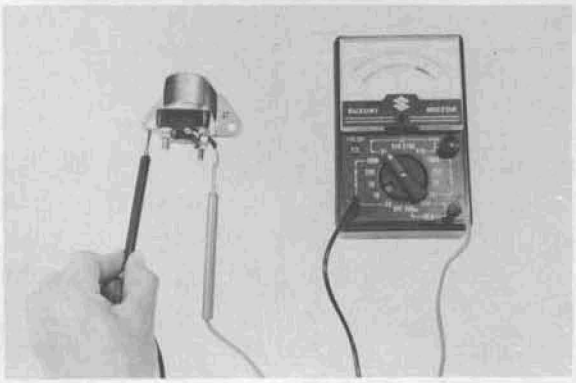


Fig. 12-27

To confirm that the contact points are closing fully to transmit the heavy load of current, first make sure the battery has an electrolite specific gravity of at least 1.26 then, operate it in the usual manner (by depressing the button on the right handle) to connect the battery to the motor and measure the voltage between the positive (+) terminal of the motor and ground; and also between the positive (+) terminal of the battery and ground. If the two readings are equal, it means that the relay contact points are satisfactory.
If the difference between the two is large or if no voltage shows up on the motor side, the contact points are faulty and the relay must be replaced.

Fig. 12-28

BATTERY

DESCRIPTION

YUASA and FURUKAWA 12N14—3A vacuum-sealed dry cell batteries are furnished with every GS850G.
This battery, when properly activated and initially charged, has a capacity of 14 ampere-hours on a 10-hour rating basis. No skill is required in activating this battery and charging it for the first time to place it in initial service; all necessary information is contained in the instructions given under the heading of INITIAL CHARGING METHOD. The battery's serviceable life depends mainly both on initial charge and on the attention it subsequently receives. Each GS850G user should be reminded of the importance of giving proper care to their batteries.

SPECIFICATIONS

Type designation	12N14-3A
Battery voltage	12 volts
Standard electrolyte S.G.	1.28 (at 20°C or 68°F)

INITIAL CHARGING METHOD

Each new GS850G motorcycle is delivered with the battery in a "vacuum-sealed dry" condition. The battery can be used after conducting the four following steps:

1. Initial electrolyte filling

Take the battery off the motorcycle, and place it on a battery servicing bench. Fill each cell to the upper level with electrolyte:

Dilute sulfuric acid solution with acid concentration of 34.6% by weight, having a specific gravity of 1.26 at 20°C (68°F). Electrolyte temperature, at the time of filling, should not be higher than 30°C (86°F).

After filling, let the battery stand for about 30 minutes. Then, check electrolyte level in each cell and, if the level in any cell has fallen add more electrolyte to bring it back to the upper level.

2. Initial charging duration

The acting materials on the cell plates have a store of energy equivalent to 75% of the rated capacity if the battery is new manufactured recently. This stored energy, however, dissipates spontaneously and progressively with lapse of time, so that, after filling it with electrolyte, the charging duration must be extended if a period of more than 6 months has elapsed since the date of manufacture (which is indicated on each battery as shown in Fig. 12-29). The standard initial charging duration being 20 hours. The charging time is to be determined according to the following schedule.

Age of dry battery (since manufacture)	Charging time
Up to 6 months	20 hours
Over 6 months or up to 9 months	30 hours
Over 9 months and up to 12 months	40 hours
Over 12 months	50 hours

Date of manufacture is indicated by a three-part number, Fig. 12-29, the leftmost part indicating for the day of the month, the middle part the month, and the last part the year.

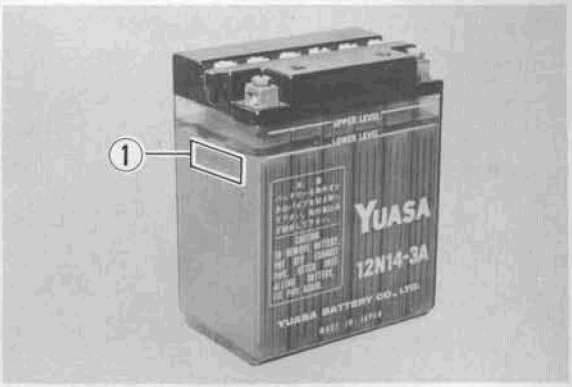


Fig. 12-29 ① Date of manufacture

3. Initial charging current

The constant-current method of charging is recommended for initial charging, and is carried out in the following manner.

1) Before turning on the charger, to which the filled battery is connected, remove the seal and cell caps. Make sure that the polarity marks are matched correctly.

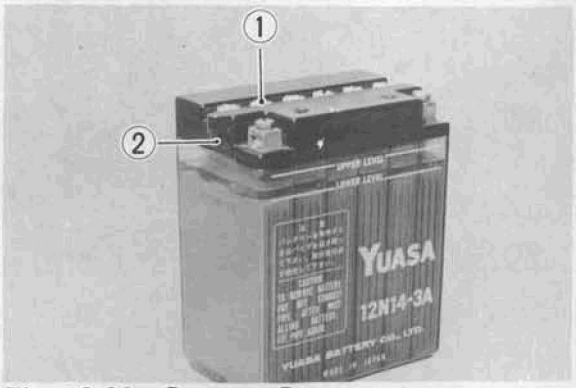


Fig. 12-30 ① Seal cap ② Battery cell cap

2) Start charging, with the charger set for a charging rate of 1.4 amperes. While charging, occasionally check the electrolyte S.G. (specific gravity) and also the charging voltage, particularly towards the end of the charging time.
3) Towards the end of the charge, the electrolyte will start releasing gas bubbles and the voltage and S.G. will be up and leveling; if not, it is likely that the vacuum seal was damage during transit or in storage. Continue charging, even in excess of the predetermined time, until the voltage and S.G. stay level, for one or two hours, with the battery allowed to continue releasing gas.

4. Electrolyte adjustment

After charging re-check the electrolyte S.G. to make sure it is 1.280 corrected for 20°C (68°F). Add distilled water, if necessary, to adjust the S.G. of each cell. Replace the caps, and wash the surfaces of the battery container with fresh water. Let the battery dry before mounting it on the motorcycle.

BATTERY SERVICING

Removal

1. Lift up the seat and open the tool holder.
2. Disconnect the lead wires from both positive and negative plates.
3. Disconnect the breather hose from the battery.
4. Remove the band remove the battery from the battery holder.

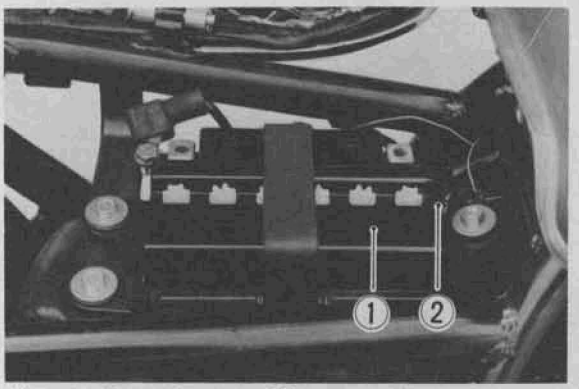


Fig. 12-31 ① Battery ② Battery vent hose

Installation

Before mounting the battery, make sure that the exterior surface of the battery container is dry and free from electrolyte. Be careful not to forget to re-connect the battery breather hose. The installing procedure is the reverse of removal.

Fig. 12-32

Inspection

1. Visually inspect the surface of the battery. If signs of cracking or electrolyte leakage from the sides of the battery are noticed, replace the battery with a new one.
2. If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper or hot water, respectively.
3. Check the electrolyte level and add distilled water, if necessary, to raise the electrolyte in each cell to the upper level.

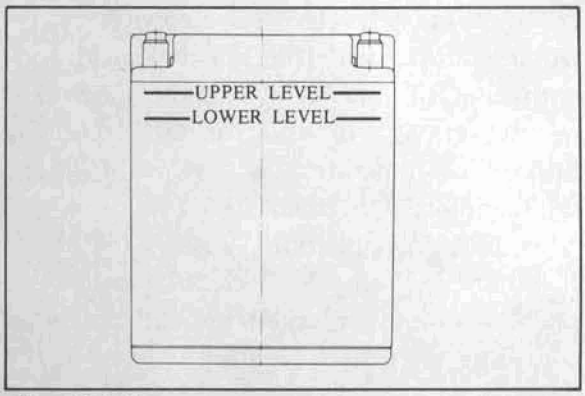


Fig. 12-33

4. Check the battery for proper charge by taking an electrolyte S.G. reading. If the reading is 1.200 or less, corrected for 20°C (68°F), it means that the battery is run-down and needs recharging.

Recharging operation based on S.G. reading

To correct on S.G. reading for 20°C (68°F), use this formula:

$S_{20} = St + 0.0007\,(t - 20)$,

Where S_{20} = corrected value of S.G. (20°C or 68°F),

St = value of S.G. read at temperature t°C,

0.0007 = temperature coefficient of S.G., and

t = temperature in degrees Centigrade, at which St was read.

To read the S.G. on the hydrometer, bring the electrolyte in the hydrometer to eye level and read the graduation on the float scale corresponding to the meniscus (curved

portion of electrolyte surface), as shown in Fig. 12-34.

Check the reading (corrected for 20°C) with Fig. 12-35 to determine the recharging time in hours by constant-current charging at a charging rate of 1.4 amperes (which is a tenth of the capacity of the present battery).

Do not permit the electrolyte temperature to exceed 45°C (113°F), at any time, during the recharging operation. Interrupt the operation, if necessary, to let the electrolyte cool down.

The battery is properly recharged if three conditions are met:

Recharging has been carried out to the specification indicated in the graph in Fig. 12-35 Electrolyte S.G. has risen to 1.280 or higher and has remained there for at least one hour. The battery terminal voltage has risen to 15—16 volts or higher and has remained there for at least one hour.

Gas bubbles are being released in every cell.

WARNING:

- *Before charging a battery, remove the seal cap from each cell.*
- *Keep fire and sparks away from a battery being charged.*

NOTE:

Constant-voltage charging, otherwise called "quick" charging, is not recommended for recharging because it may shorten the life of the battery.

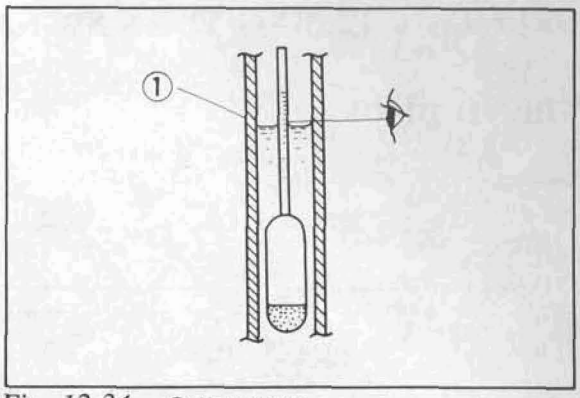


Fig. 12-34 ① Hydorometer

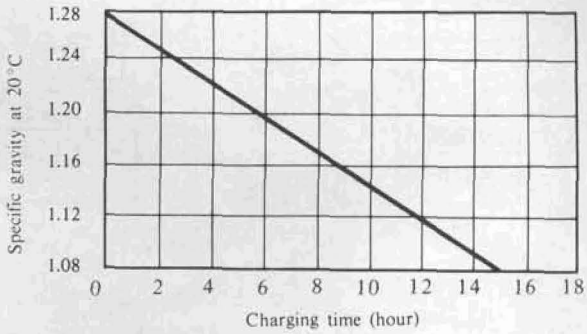
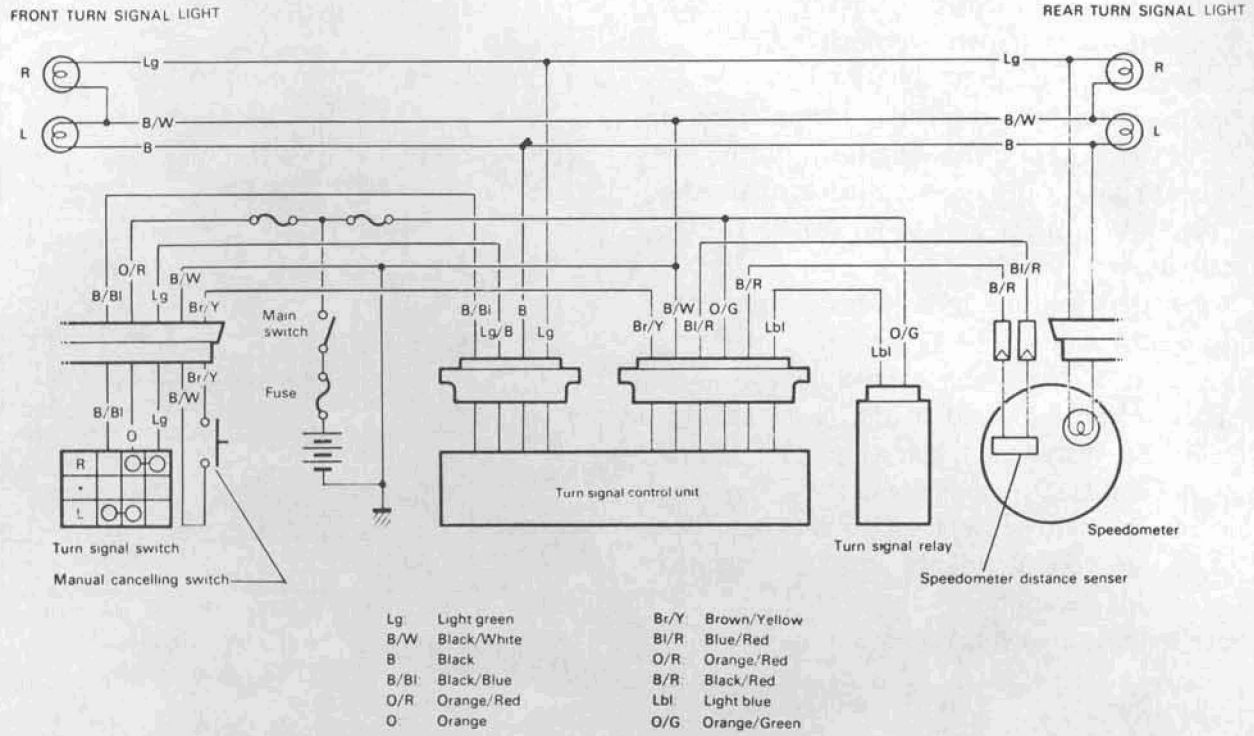


Fig. 12-35

SELF-CANCELLING TURN SIGNAL SYSTEM

CIRCUIT DIAGRAM



Lg	Light green	Br/Y	Brown/Yellow
B/W	Black/White	Bl/R	Blue/Red
B	Black	O/R	Orange/Red
B/Bl	Black/Blue	B/R	Black/Red
O/R	Orange/Red	Lbl	Light blue
O	Orange	O/G	Orange/Green

Fig. 12-36

- When the Turn Signal Knob is switched to LEFT or RIGHT, the turn signal light starts flashing.
  If the motorcycle speed is faster than 15 km/h (9.3 mph), flashing will be switched off automatically about 9 sec after the knob is released.
- The timer does not operate when the motorcycle stops or runs at a speed slower than 15 km/h.
  Only when the motorcycle runs at speeds faster than 15 km/h does the timer operate to switch the turn signal off automatically when the total time above that speed exceeds 9 sec.
- When the Turn Signal Knob is switched on again before it is turned off automatically, flashing will go off 9 sec after this time at speed faster than 15 km/h.
- Flashing can be switched off before it goes off automatically, by pressing the Turn Signal Knob downward.

REMOVAL

- Remove the turn signal light switch (See page 11-2)
- Remove the speedometer (See page 11-6)
- Remove the frame right cover.
- Remove the turn signal control unit coupler from the wiring harness.
- Remove the band holding the turn signal control unit and remove the unit.

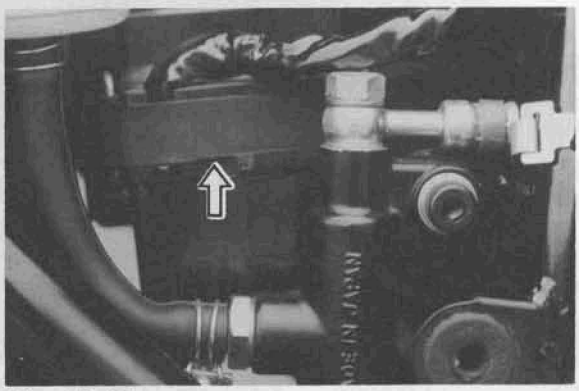


Fig. 12-37

MOUNTING

For mounting, reverse the procedure for removal.

TROUBLESHOOTING

BATTERY

Symptom	Probable cause	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	1. Not enough electrolyte	Add distilled water, if the battery has not been damaged and "sulfation" has not advanced too far, and recharge.
	2. Battery case is cracked.	Replaced the battery.
	3. Battery has been left in a run-down condition for a long time.	Replaced the battery.
	4. Adulterated electrolyte (Foreign matter has enteres the battery and become mixed with the electrolyte.	If "sulfation" has not advanced too far, try to restore the battery by replacing the electrolyte, recharging it fully with the battery detached from the motorcycle and then adjusting electrolyte S.G.
Battery runs down quickly.	1. The charging method is not correct.	Check the alternator, regulator and circuit connections, and make necessary adjustments to obtain specified charging operation.
	2. Cell plates have lost much of their active material as a result of over-charging.	Replace the battery, and correct the charging system.
	3. A short-circuit condition exists within the battery due to excessive accumulation of sediments caused by the high electrolyte S.G.	Replace the battery.
	4. Electrolyte S.G. is too low.	Recharge the battery fully and adjust electrolyte S.G.
	5. Adulterated electrolyte.	Replace the electrolyte, recharge the battery and then adjust S.G.
	6. Battery is too old.	Replace the battery.
Reversed battery polarity.	The battery has been connected the wrong way round in the system, so that it is being charged in the reverse direction.	Replace the battery and be sure to connect the battery properly.

SELF-CANCELLING TURN SIGNAL

Referring to the Circuit Diagram, check the condition of: 1) the lead connector of the left handle switch (Turn Signal Knob), 2) the lead of the Turn Signal Relay, and 3) the lead of the Speed Sensor as indicated below.

Fig. 12-38

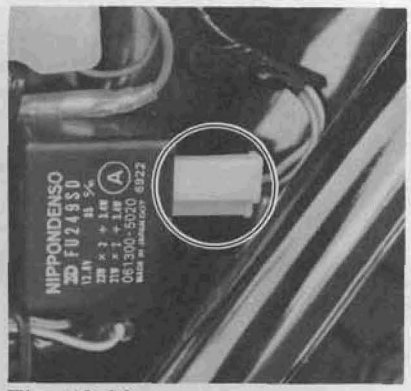


Fig. 12-39

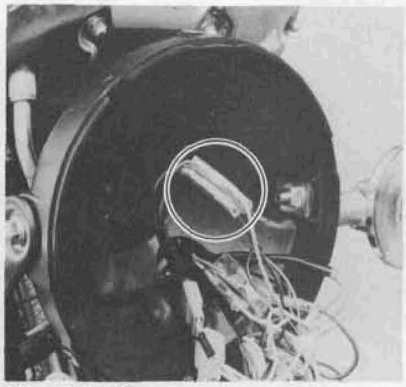
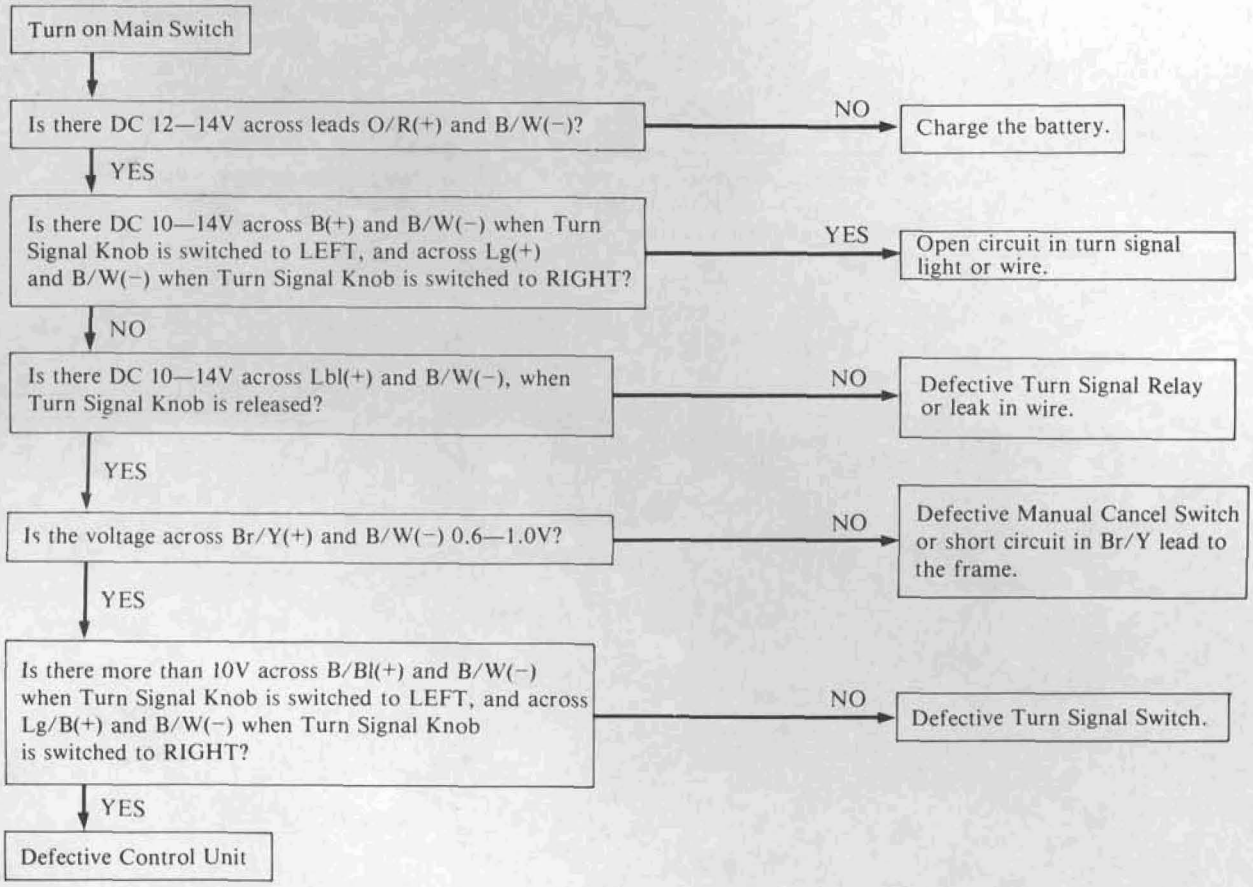
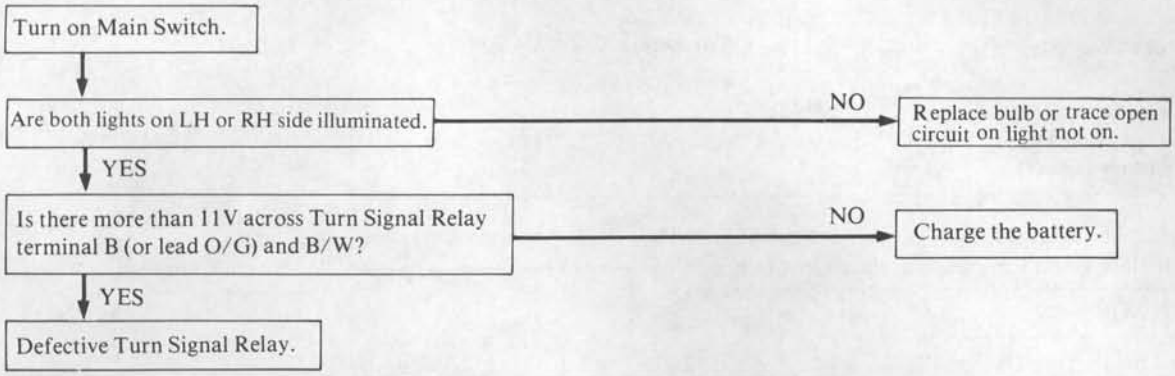


Fig. 12-40

1. The turn signal lamp does not light.



2. The turn signal light lights continuously (does not flash).



3. Flashing does not go off after 9 ± 1 sec at speeds faster than 15 km/h (9.3 mph)

Check Turn Signal Switch, Speed Sensor, and the speedometer cable in the following manner. If they are found to be normal, Control Unit may be defective.

3-1. Turn Signal Switch

Disconnect wires coming from Control Unit at the harness connector.

Using a circuit tester check that continuity is obtained, between leads Bl and B when Turn Signal Knob is switched to LEFT, and that continuity is not obtained when the knob is released. Continuity should be obtained between Bl and Lg when Turn Signal Knob is switched to RIGHT, and not obtained when the knob is released.

If above conditions are satisfied, Turn Signal Switch is normal.

3-2. Speed Sensor

Remove the meter cable from the speedometer.

Insert a straight slot screwdriver in the boss of the meter, and slowly turn the screwdriver one turn.

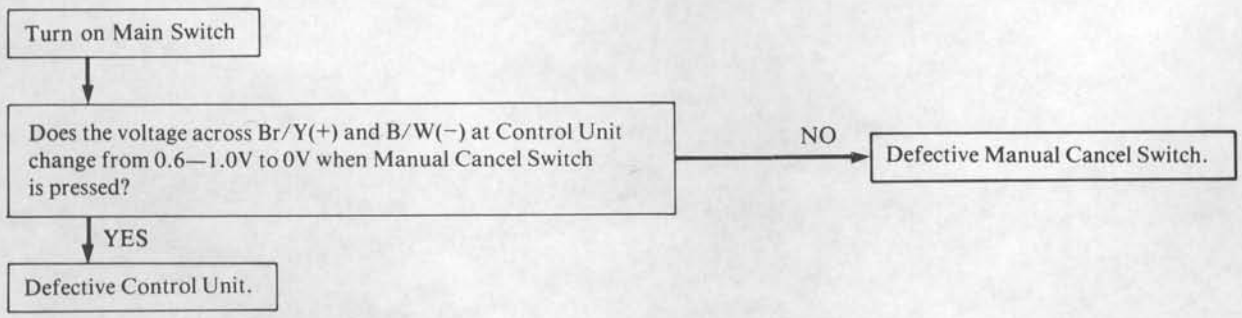
If continuity/no continuity is obtained between leads B/R and Bl/R alternatively, i.e. for ON/OFF, ON/OFF, ON/OFF, ON/OFF, then the speed sensor is normal.

CAUTION:
The lead relay used in the Speed Sensor is rated at 10 mA max.
Do not exceed the rated current when checking continuity, otherwise contacts may be damaged.

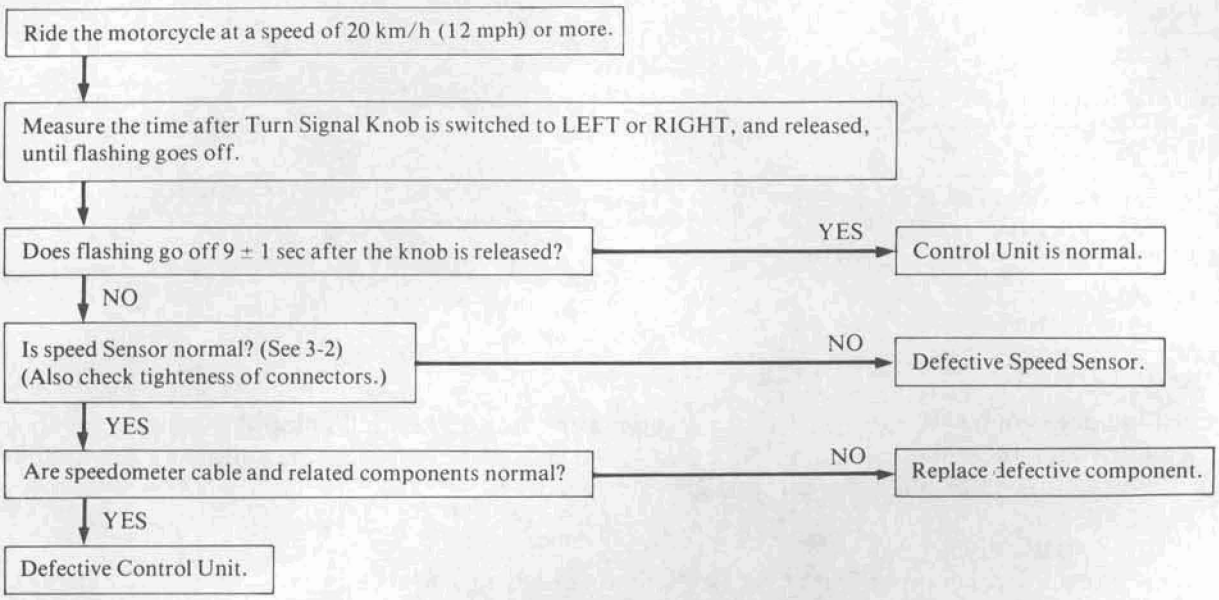
- Check speedometer cable and driving components.

4. Flashing does not go off when Manual Cancel Switch is pressed.

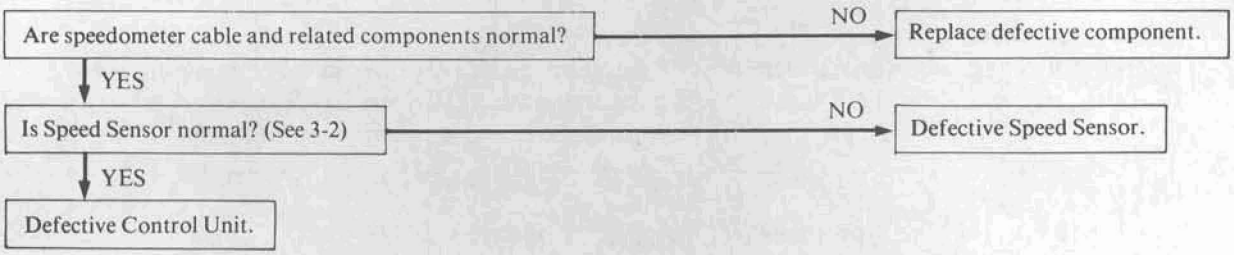
- Check that continuity between leads B/W and Br/Y is obtained when Manual Cancel Switch is pressed.



5. Flashing goes off before 9 ± 1 sec.



6. Flashing does not go off at a speed of 15 km/h (9.3 mph) or more.



GEAR SHIFTING SWITCH AND GEAR POSITION INDICATOR

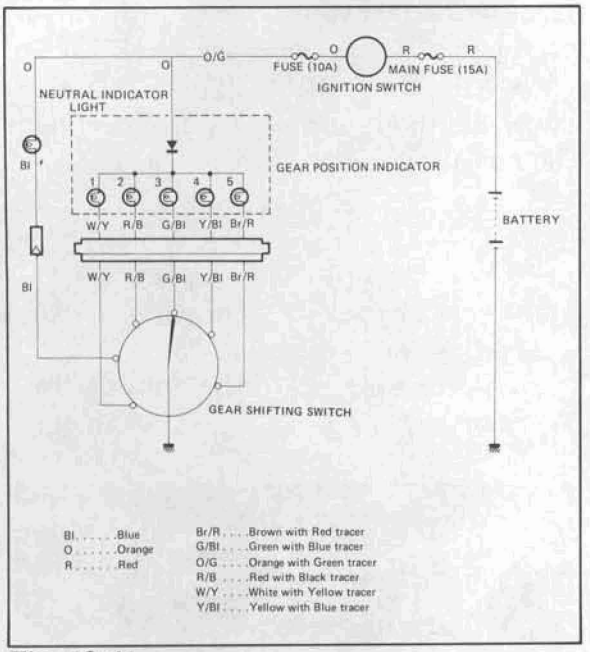


Fig. 12-41

If the neutral indicator light and gear position indicator light do not come on, disconnect the lead wires coming from the gear shifting switch at the coupler and terminals, and check continuity between the O lead and Bl lead, and also between the W/Y, R/B, G/Bl, Y/Bl and Gr/R in the coupler using the Pocket Tester.

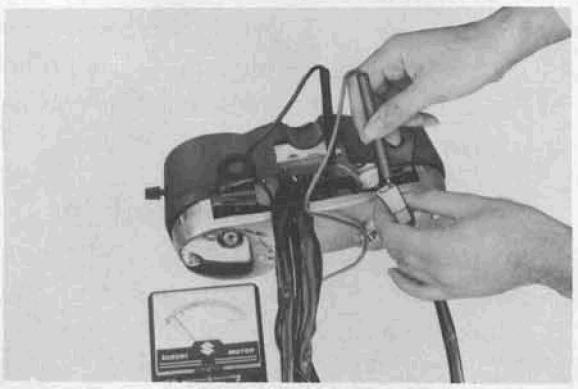


Fig. 12-42

NOTE:
When checking the continuity of the gear indicator (inside the coupler), connect the positive (+) terminal of the Pocket Tester to the terminal in the coupler, and connect the negative (−) terminal to the orange lead wire.
If there is no continuity, the indicator light bulb is burnt out and it should be replaced.

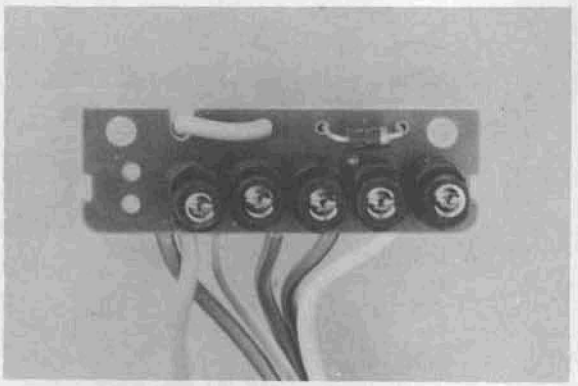


Fig. 12-43

If the above check reveals no irregularity, remove the gear shifting switch from the crankcase, and using a lead wire of the Pocket Tester, ground one of the gear shifting switch contact points and check the condition of the gear shifting switch. If both neutral and gear position indicator lights turn on, the switch is in good condition. (To make this check, the ignition switch should be turned on with the wiring normal.)

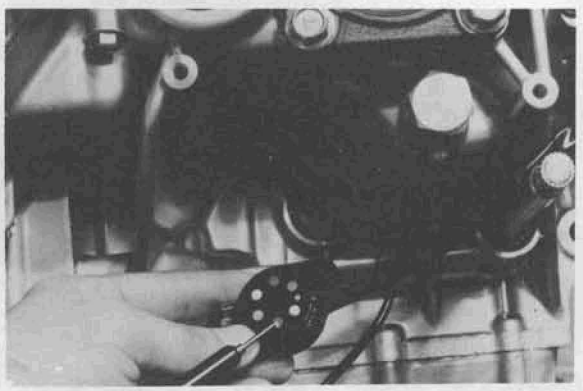


Fig. 12-44

UTILITY SWITCHES AND DEVICES

IGNITION SWITCH

Confirm that ignition switch ①, when checked with a circuit tester, has internal continuity as indicated in the chart below, and replace it if the condition is not as indicated in the chart.

Ignition switch continuity chart

Switch position	Terminals			
	RED	ORANGE	GRAY	BROWN
OFF				
ON	○——○		○——○	
P	○——	——	——	——○

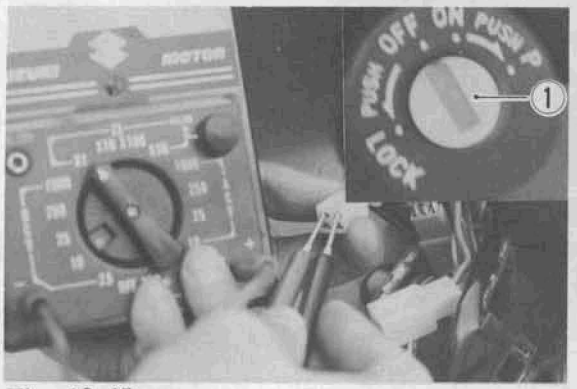


Fig. 12-45

FRONT BRAKE LIGHT SWITCH

To confirm continuity of this light switch, with the front brake lever squeezed place the tester probe pins on the WHITE ① and ORANGE ② lead wires.

NOTE:
To advance of retard the action of this switch change the switch position by loosening the 2 screws securing the switch to the body ③.

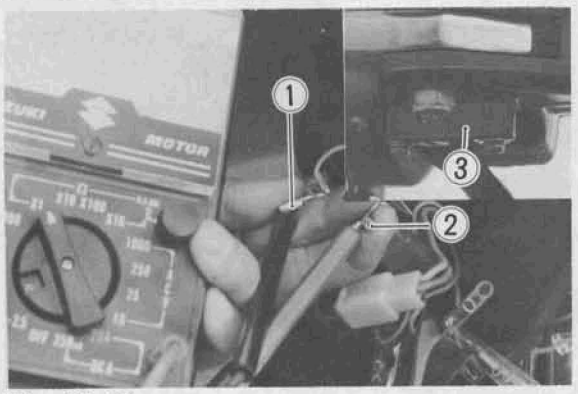


Fig. 12-46

REAR BRAKE LIGHT SWITCH

This switch is checked in the same way as the front brake light switch is tested for internal continuity. Its lead wires are WHITE ① and ORANGE with GREEN tracer ②. Press down on the brake pedal, and continuity should be obtained.

NOTE:
To make the switch close sooner turn on the light by pressing down on the brake pedal, and reposition the switch body ③ upward. Lowering it retards the action.

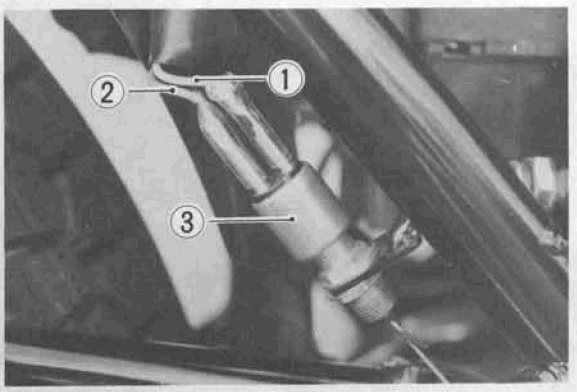


Fig. 12-47

LEFT HANDLE SWITCH

This switch operates the lighting, dimmer, turn signal and horn switches. Circuit continuity through each switch component can be checked by placing the two testing probes of the circuit tester on the switch leads (at the coupler).

LIGHTING AND DIMMER SWITCHES

The lighting and dimmer switches should show continuity, when checked with the circuit tester, according to the chart below.

Dimmer switch

	WHITE	YELLOW
HI		○——○
LO	○——	——

	ORANGE	GRAY	WHITE/ RED	WHITE/ GREEN
OFF				
ON	○——	——	○——	——○

LIGHTING SWITCH

If abnormally high resistance is noted when checking continuity, it probably means that the contact points in the switch are faulty and need repairing.

HORN AND HORN SWITCH

Check the sound of the horn with a 12-volt battery and continuity of the horn switch using the circuit tester.

- If the volume of the horn is insufficient, adjust it by turning the adjusting screw ① on the back of the horn.
  After adjustment, be sure to apply a thin coat of SUZUKI THREAD LOCK CEMENT to the adjusting screw.

Make sure that the horn has full volume when its lead wires are connected to the battery terminals, if not, replace the horn.

Switch position	GREEN	BLACK/WHITE
OFF		
ON	○———	———○

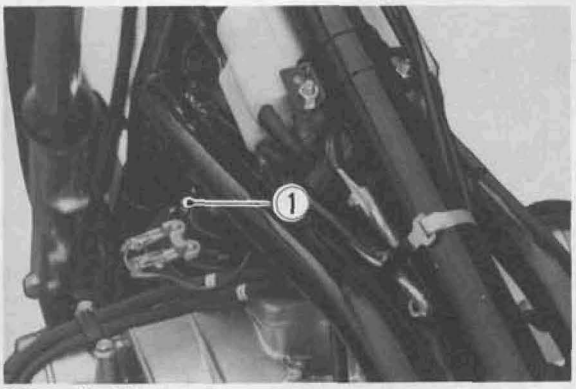


Fig. 12-48

STARTER DISCONNECT SWITCH

Confirm that this switch shows continuity when the clutch lever is squeezed by placing the tester probes on the YELLOW/GREEN ① and YELLOW /GREEN ② lead wires of the switch.

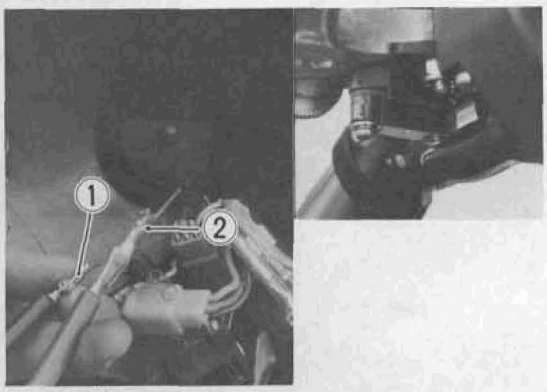


Fig. 12-49

KILL SWITCH AND STARTER SWITCH

These switches are checked in the same way as the lighting switch.

Kill switch

Switch position	ORANGE	ORANGE/WHITE
OFF		
RUN	○———	———○

Starter switch

Switch position	YELLOW/GREEN	ORANGE/WHITE
OFF		
ON	○———	———○

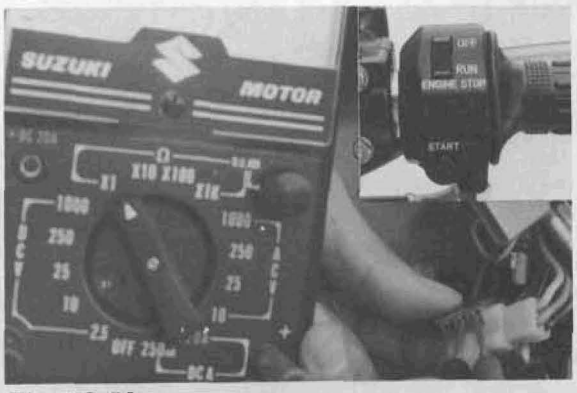


Fig. 12-50

OIL PRESSURE SWITCH

This switch is located on the discharge side of the oil pump and turns the warning light on and off in response to the discharge pressure.

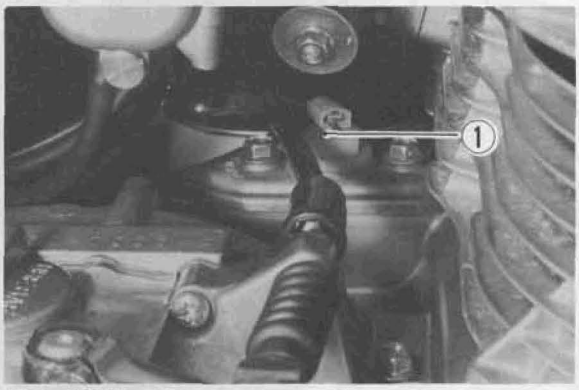


Fig. 12-51 ① Oil pressure switch

If the switch is functioning normally, when the engine is stopped and the switch is turned on the oil pressure indicator light comes on and goes out immediately when the engine starts. This indicates that the oil pump is delivering enough oil to the engine.

Two possibilities must be taken into consideration when the switch and light do not operate as stated above. One is that the switch is faulty due to an open-circuit or grounding (this can be checked with the circuit tester).

The other is a mechanical malfunction—an inability of the switch to respond to the applied pressure which can be checked by measuring the oil pressure when the engine is running. If the pressure is low, the oil pump is malfunctioning; if high, the switch is mechanically defective and must be replaced.

LIGHT WATTAGE DATA

The lighting system of the Model GS850G uses lights with the following rated wattages.

Headlight	12V, 50/40W
Tail/Brake light	12V, 8/23W (3/32 cp)
Turn signal light	12V, 23W (32 cp)
License plate light	12V, 8W (3 cp)
Speedometer light	12V, 3.4W
Tachometer light	12V, 3.4W
Neutral indicator light	12V, 3.4W
High beam indicator light	12V, 3.4W
Turn signal indicator light	12V, 3.4W
Oil p. indicator light	12V, 3.4W

INSPECTION OF HEADLIGHT

- Confirm that the bulb is not burnt out.
- Confirm that the wiring is not damaged and that there are no poor connections.
- Confirm that each connection is tightly fastened.
- Confirm that the beam angle is correct.

See page 11-7 for adjustment procedure of the beam angle.

INSPECTION OF TAIL/BRAKE LIGHTS AND TURN SIGNAL LIGHTS

- Confirm that the bulb is not burnt out.
- Confirm that the wiring is not damaged and that there are no poor connections.
- Defective grounding or a short-circuit exists when the front and rear signal lights continue to stay lit after the switch has been turned off.
- Confirm that each connection is tightly fastened. Loose connections can shorten bulb life due to vibration.

REAR COMBINATION LIGHTS

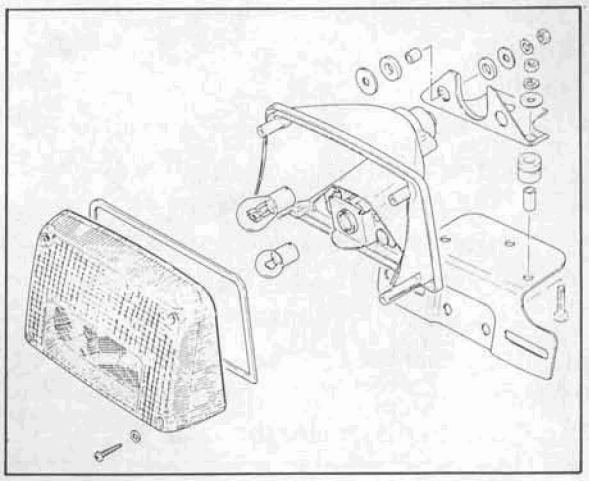


Fig. 12-52

TURN SIGNAL LIGHTS

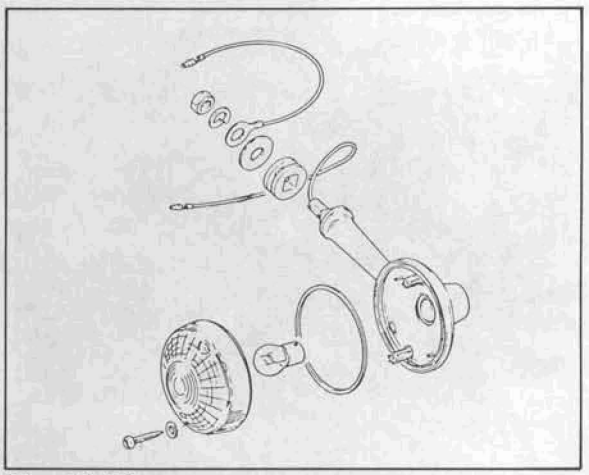


Fig. 12-53

Inspection of speedometer and tachometer

- Replace burnt out bulbs after removal of meters. See page 11-6 for removal procedures.

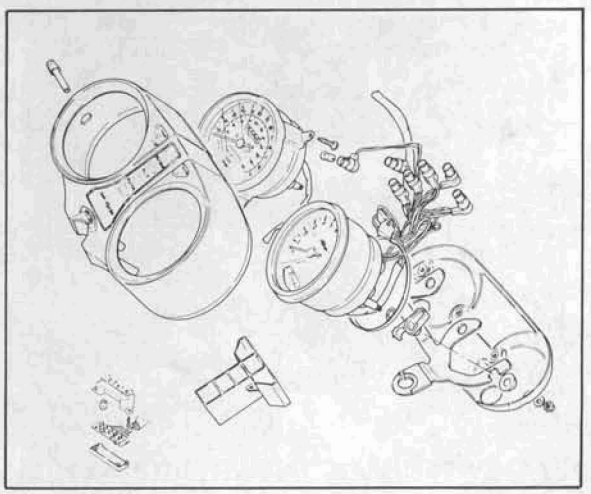


Fig. 12-54

FUEL GAUGE

Wiring

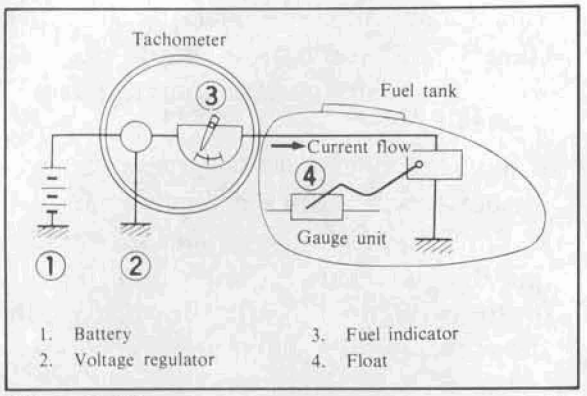


Fig. 12-55

The above drawing is a schematic of fuel gauge wiring. The internal resistance value of the gauge unit is adapted to vary with the height of the float. It is difficult for current to pass through the circuit when the resistance value is high, an consequently the swing of the meter is small (close to point E).

The more current passes through the circuit, increasing the swing of the pointer (close to point F), when the resistance value is low.

2. The relationships between the amount of gasoline and meter indications are as follows:

Amount of gasoline (in liters)	Meter indication
2.4	Point E—2°30
3.0	E
7.7	Red zone max. limit
10.5	1/2
18.0	F
18.7	Point F + 5°

The meter points to E—2°30′ when the amount of gasoline is between 0 to 2.4 liters. Also the meter points to F +5° when the amount of gasoline in the tank is between 18.7 liters and full.

3. Construction of each portion and operating meter

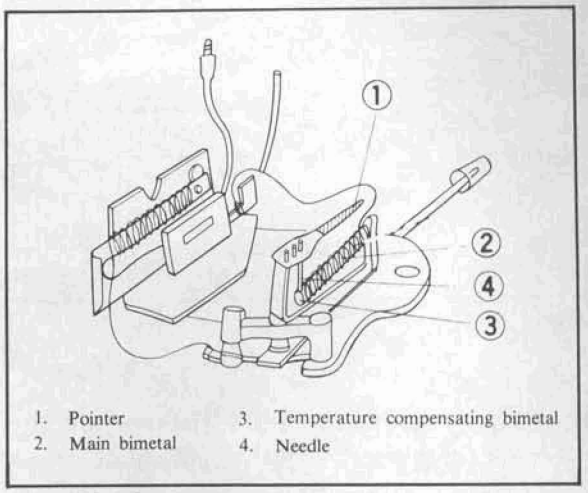


Fig. 12-56

- Main operation
  Current passing through the heater wire deflects the main bimetal causing the pointer to move.
- Auxiliary operation
  This compensates for variations in temperature and voltage. A temperature compensating bimetal is provided so that no indication errors occur due to temperature changes inside the meter:

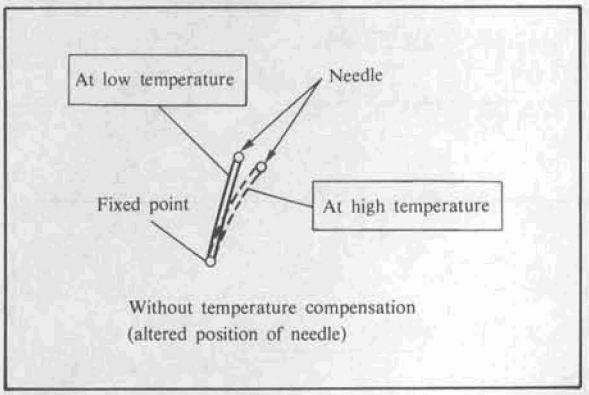


Fig. 12-57

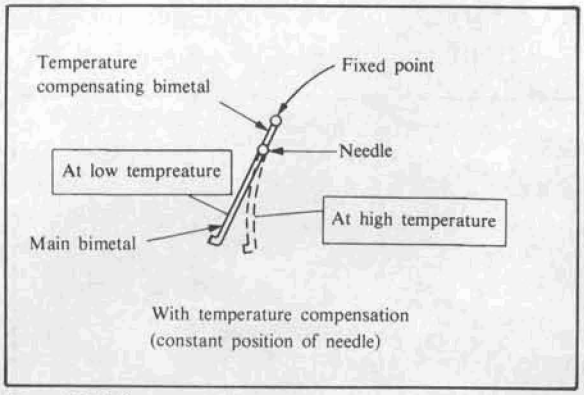


Fig. 12-58

Even if the temperature rises inside the meter and causes the main bimetal to deflect as shown in the above drawing, the temperature compensating bimetal will deflect to the same degree as the main bimetal, in the reverse direction, to keep the needle position constant.

- Voltage regulator

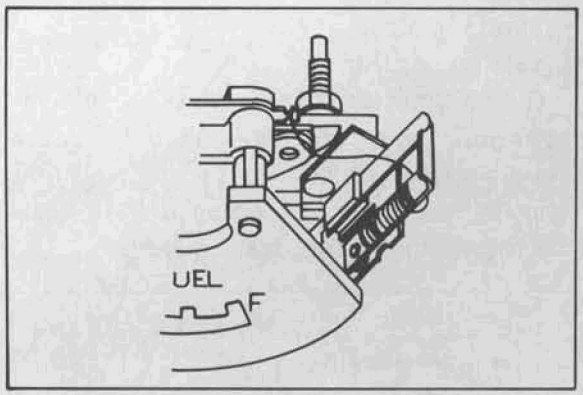


Fig. 12-59

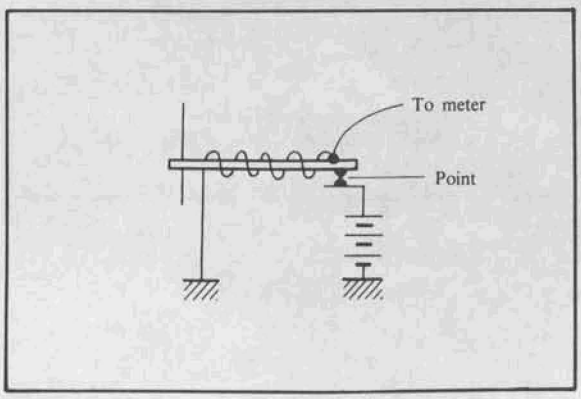


Fig. 12-60

The passage of current through the heater wire deflects the bimetal and causes point separation. This point separation stops the current until the bimetal begins to cool which causing the point to connect again.

A large amount of current passes through the heater wire when the supply voltage is high, causing the bimetal to deflect quickly, and the points to separate. This is illustrated in the following drawing which shows that the average current is constant.

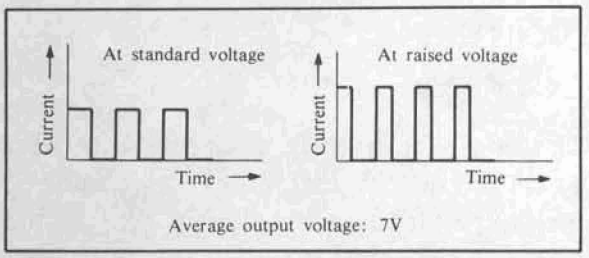


Fig. 12-61

- Gauge unit
  The displacement of the float changes the position of the contact plate which slides on a wire wound resistor causing the resistance value to vary.

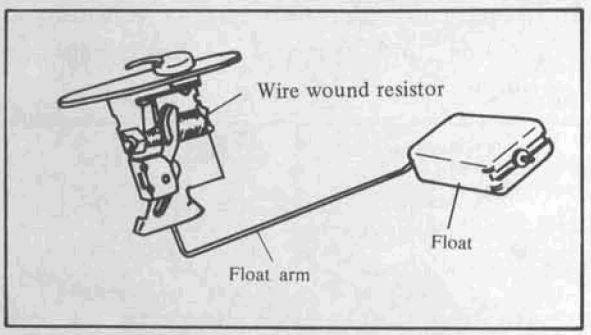


Fig. 12-62

INSPECTION OF FUEL METER AND GAUGE

The fuel meter is enclosed within the tachometer assembly.

The following table is used for troubleshooting.

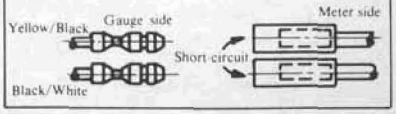
Amount of gasoline (ℓ)	1.5	2.7	6.1	9.3	15.8	16.3
Resistance (Ω)	110	95	52	32.5	7	3

Pointer failure and minus indication

(1) Meter pointer fails to move.
(2) Meter has a substantial minus indication when key is turned on.

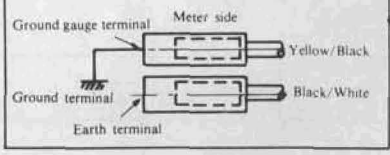
Checking method

(1) Determine whether trouble is within meter or gauge.
Remove gauge connector to short-circuit meter side of same connector (make gauge resistance equal to zero Ω), and observe meter indication.



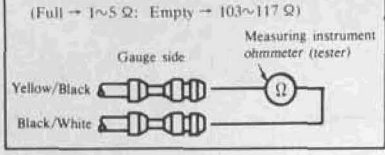
- Meter pointer fails to move → Meter side defective → Check (2)
- Meter pointer swings to extreme position → Gauge defective → Check (3)

(2) Meter check.
Ground meter terminal of meter side connector directly to frame and observe meter indication.



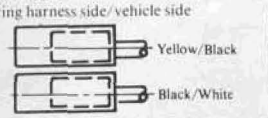
- Meter pointer fails to move → Meter side defective → Check (5)
- Meter pointer swings to extreme position → Wiring harness defective → Check (4)
  (Contact of connector terminal)

(3) Gauge check.
Measure resistance value between two terminals of gauge side connector.
(Full → 1~5 Ω: Empty → 103~117 Ω)



- Large, unstable resistance → Gauge defective → Replace gauge
  (More than 117 Ω)
- Normal resistance value → Wire harness defective → Check (4)
  (1~117 Ω) (Contact of connector terminal)

(4) Connector contact check (wiring harness side).
Strengthen spring pressure against terminal at wiring harness side connector (to improve contact) and observe meter indication.
(by normal wiring)



→ Normal indication of meter

(5) Connector contact check (wiring harness side).
Strengthen spring pressure against terminal of 6-pole connector at wiring harness side (to improve contact) and observe meter indication.

- Meter pointer swings to extreme position → Connector contact defective
- Meter pointer fails to move → Meter defective → Change meter

Carry out check (2) at the same time.

Meter pointer swings to extreme position and indicates plus.
(1) Swinging-up of pointer.
(2) Substantially plus indication of meter.

Method of checking

(6) Meter side check.
Remove gauge connector (without connecting gauge) and observe meter indication.

- With meter indication (operates) → Meter defective → Change meter
- With no meter indication → Check (7)

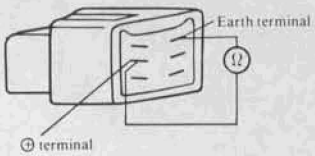
(7) Gauge side check.
Measure resistance value of gauge according to (3).

- Small resistance, OΩ → Defective unit → Change gauge
  (Full → less than 0.5Ω)
  (Empty → less than 102Ω)
- Normal resistance value → Check (8)

(8) Meter side check (operate voltage regulator).
Check meter voltage between gauge terminal (yellow/black lead wire) of meter or gauge terminal (as it is connected) of connector for gauge and ground.

- Indicates interrupted voltage → Meter defective → Change meter
  (Even when meter is normal, interrupted voltage can be obtained. However, here, the meter is defective because the pointer swings to extreme position.)
- Indicates constant voltage → Check (9)

(9) Meter side check.
Remove 6-pole meter side connector and measure resistance value between
⊕ terminal and ground terminal.



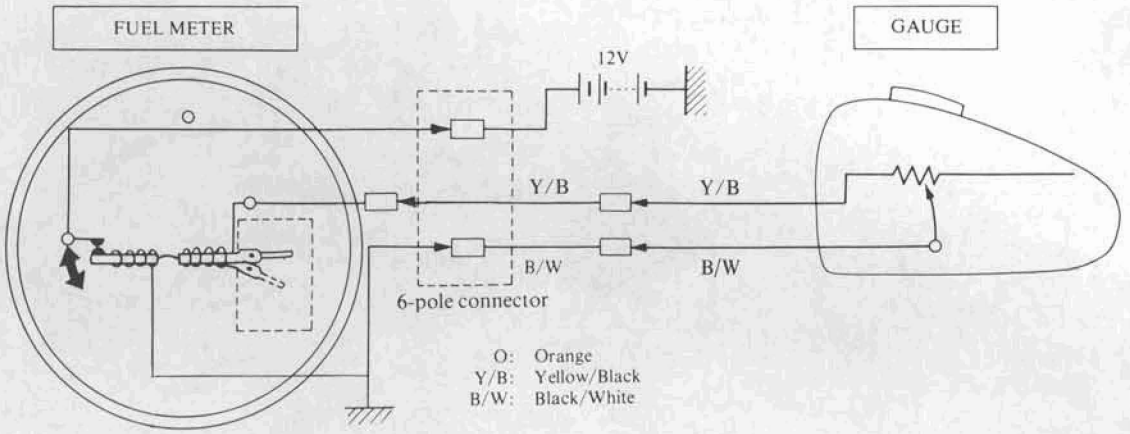
- Large resistance, infinite → Meter defective → Change meter
- Resistance value (55—85Ω) → Wire harness defective → Check (10)

(10) Ground connector check.
Check grounding condition of ground terminal of 6-pole meter side connector at vehicle side. Measure resistance value between ground terminal shown in drawing (5) and frame grounding.

- Large resistance, no conductance → Ground wire harness defective → Check (11)
- Resistance 0Ω → Defective contact of meter side connector → Check (11)

(11) Connector contact check.
Observe meter indication after correcting wire harness and connector (in the normal wiring).

- Minus meter indication → Seizure of meter is caused by defective wiring harness → Change meter / Check wiring harness
- Normal meter indication O.K.
- Seized meter (change)



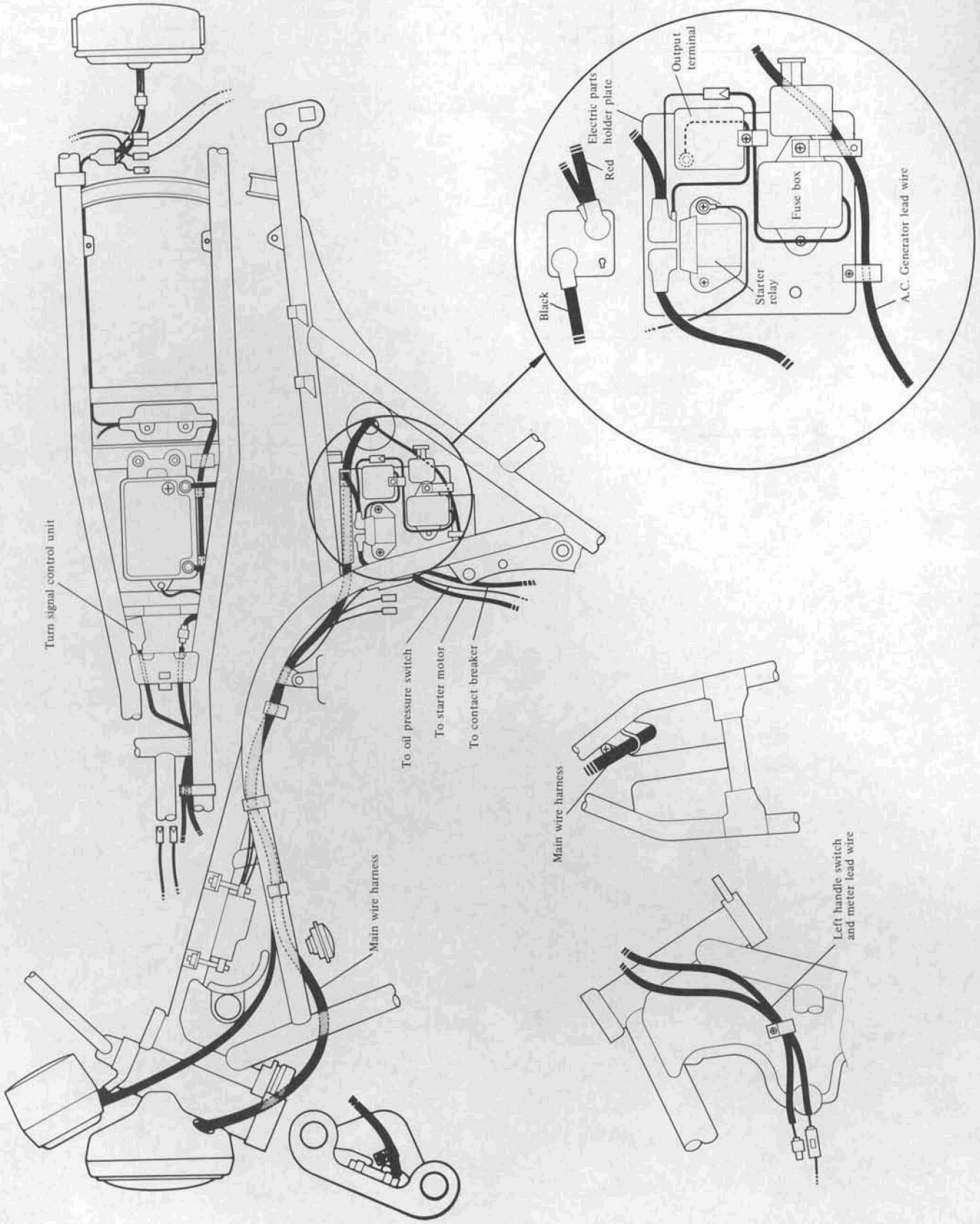
Check resistance value between terminals
Meter side

Orange-Yellow/Black 45–65Ω
Orange-Black/White 55–85Ω

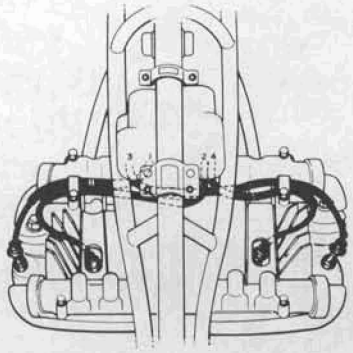
Gauge side

Full 1–5Ω
Empty 103–117Ω

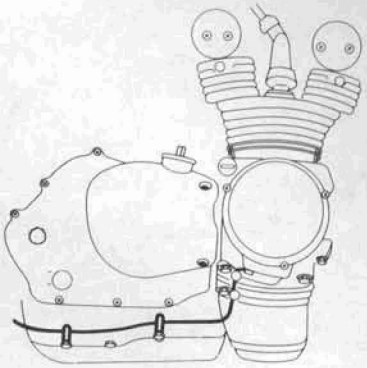
WIRE ROUTING



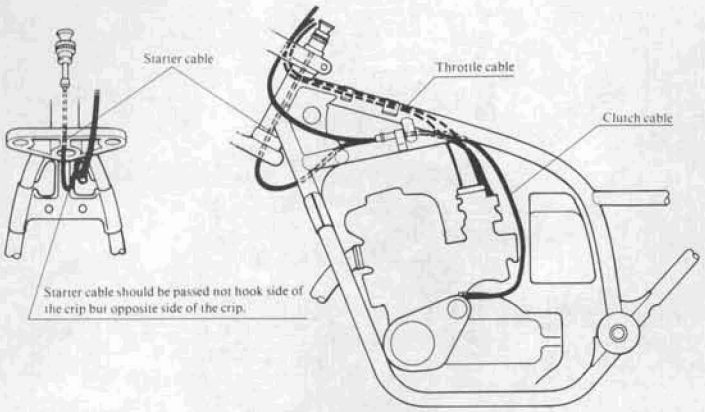
How to route the high-tension cord.

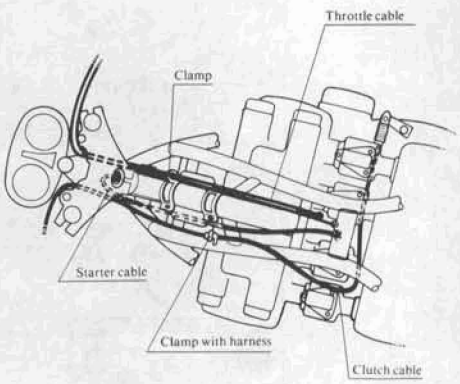


How to route contact breaker lead wire.

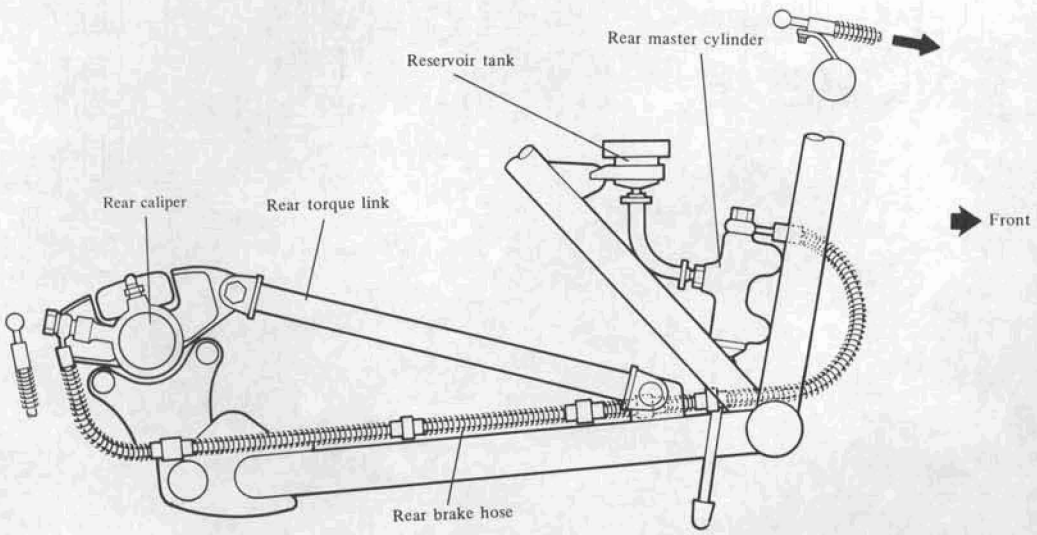


CABLE ROUTING

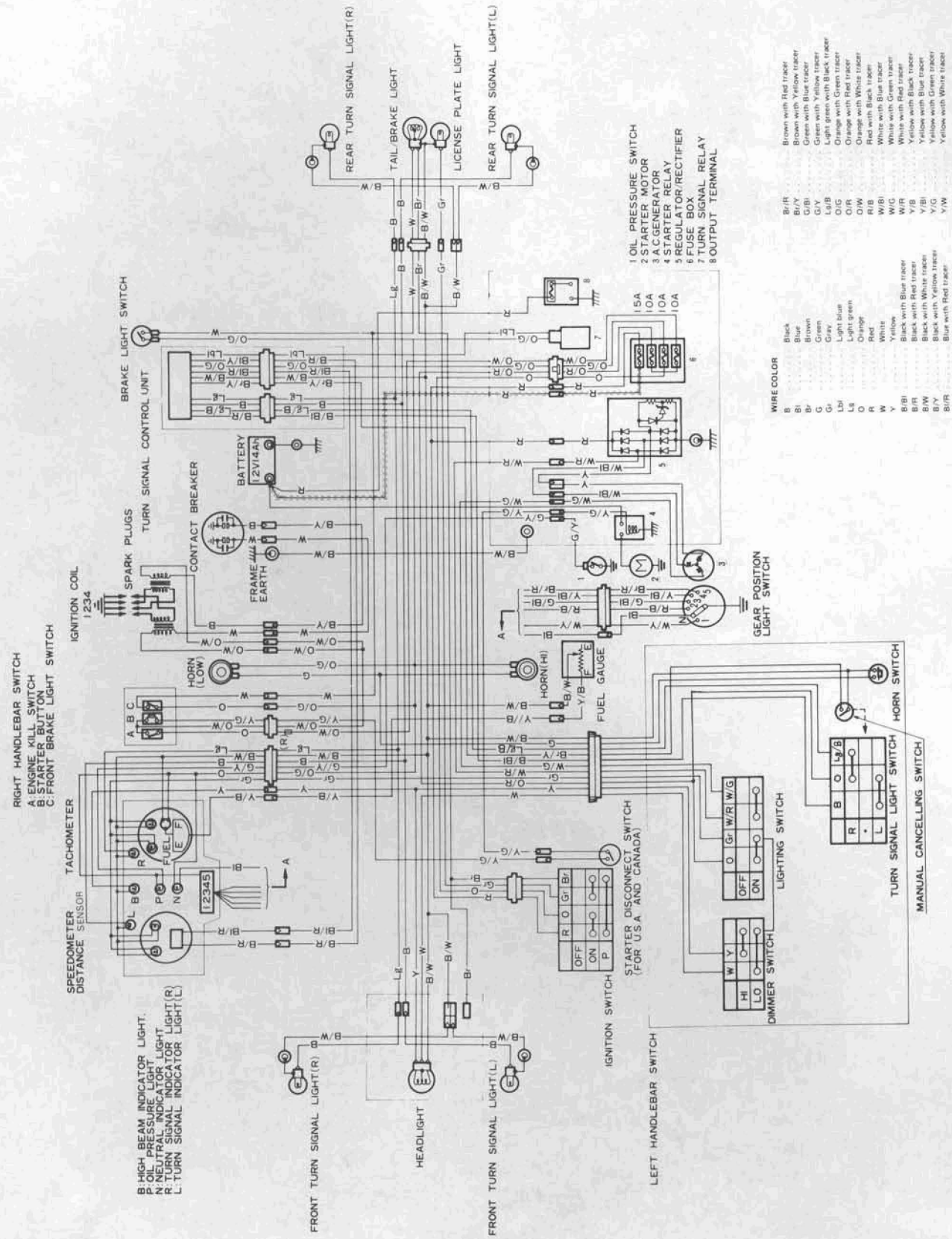




REAR BRAKE HOSE ROUTING



WIRING DIAGRAM



INSPECTION AT SETTING-UP

Inspect the following points at the time of setting up. In addition to this list, please use the "Certification of Vehicle Predelivery " form giving one copy to the customer and retaining the original in your file.

ENGINE AND TRANSMISSION

Spark plug	(Type, Gap and torque)
Contact point	(Clean and adjust)
Ignition timing	(Check and adjust)
Throttle cable(s)	(Check cable play and adjust)
Idle RPM	(Check and adjust)
Exhaust system	(Leakage)
Fuel system connection	(Circlip)

CHASSIS

Clutch cable (Check and adjust)
Front brake
Cable routing
Rear brake
Brake fluid
The contacts between the brake hose, meter case, etc.
Pedal position
Pedal play
Tire pressure (Check and adjust)
Cast wheel (Check)
Lubrication of all necessary points
Battery (Charge, vent tube location and attachment)
Wiring and cable routing
Wiring connectors (Cleaned and tight)
Front fork air pressure
Shocks spring preload damping position
Tighten all nuts and bolts (Torque those listed in manual)
Cotter pins (Fasteners check)
Wash and polish

ROAD TEST INSPECTION

Engine starting	(Acceleration, smoothness and noise)
Transmission	(Operation and noise)
Clutch	(Operation and noise)
Brake operation	(Operation and noise)
Steering	(Stability and tracking)
Suspension operation	
Control cables	(Operation and proper return)
Leakage	(Fuel/Oil/Exhaust)
Speedometer and tachometer operation	
Digital gear indicator operation	

PREDELIVERY CHECKLIST

Brake fluid level	(Front and rear)
Paint and chrome	
Electrical system	
Tail and stop light	(Front and rear)
Turn signals and indicator light	
Headlight beam	(Adjust)
Instrument lights	
Oil pressure light	
High beam indicator light	
Neutral light	
Horn	
Fuel gauge operation	
Kill switch operation	

GS850GT

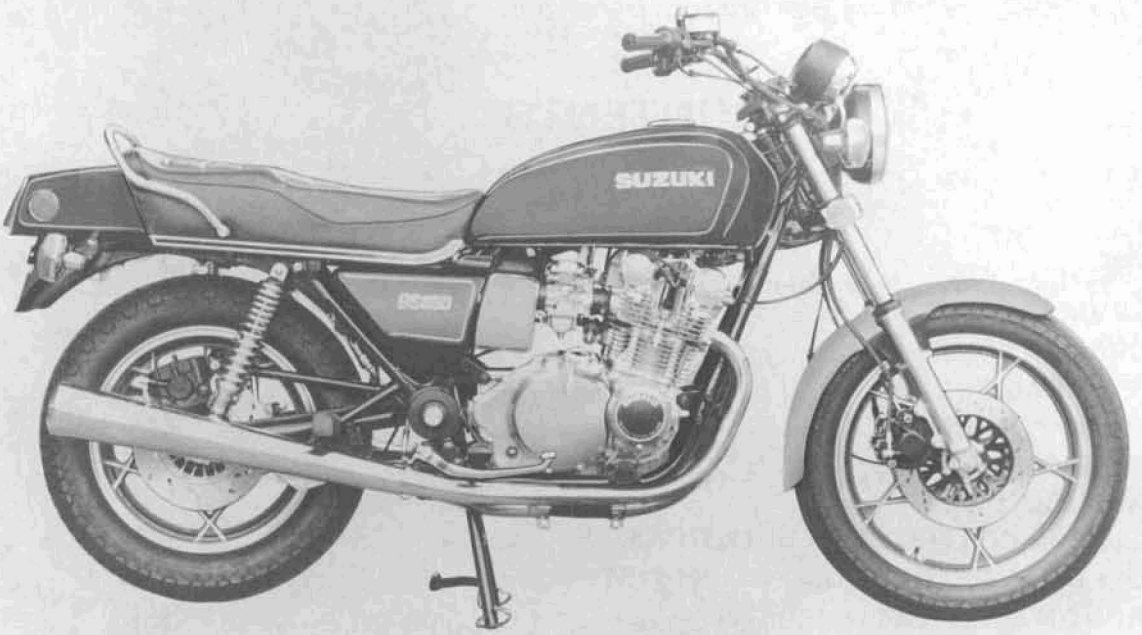
This section gives service data and servicing procedures which differ from those of the GS850GN and describes the new features of the GS850GT. Refer to the sections 1 through 13 except for the items described in this section.

CONTENTS

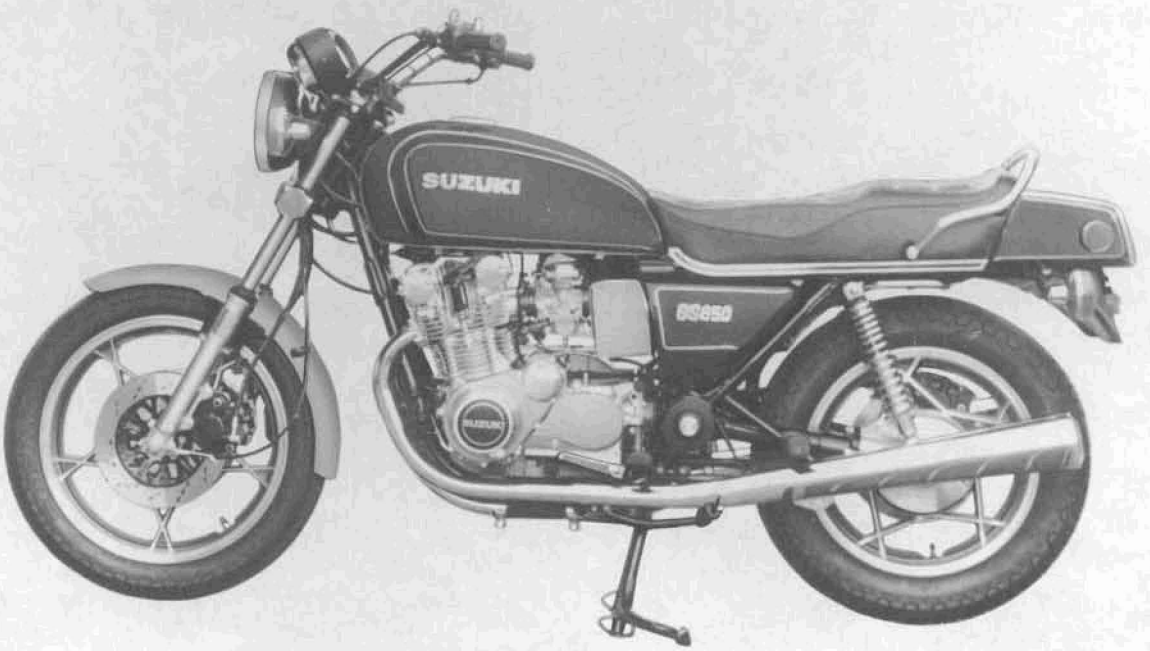
VIEW OF GS850GT 14- 2
SPECIFICATIONS 14- 3
SERVICE DATA 14- 5
TORQUE TABLE 14-16
SPECIAL MATERIALS 14-18
PERIODIC MAINTENANCE 14-20
MODIFICATIONS 14-21
CARBURETOR 14-27
EMISSION CONTROL & REGULATIONS 14-41
FULL-TRANSISTORIZED IGNITION SYSTEM 14-45
FRONT MASTER CYLINDER 14-47
FRONT CALIPER 14-51
REAR WHEEL 15-55
WIRE AND CABLE ROUTING 14-56
WIRING DIAGRAM 14-58

VIEWS OF GS850GT

The major differences between the GS850G "T" and "N" models are the ignition system, starter system and carburetors.
That is, the ignition system has been changed to the maintenance-free transistorized ignition system, the kick starter system is eliminated, and variable-venturi type "BS-type" carburetors are applied.



Right side



Left side

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 230 mm (87.8 in)
Overall width	865 mm (34.1 in)
Overall height	1 190 mm (46.9 in)
Wheelbase	1 500 mm (59.1 in)
Ground clearance	160 mm (6.3 in)
Dry mass	253 kg (558 lbs)
Gross vehicle weight rating	455 kg (1 003 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm^3 (51.4 cu. in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS32SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 00′
Trail	113 mm (4.45 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50H19 4PR
Rear tire size	4.50H17 4PR
Front tire pressure	1.75 kg/cm² (25 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve		22 L (5.8 US gal)
	reserve	4.2 L (1.1 US gal)
Engine oil	change	2.8 L (3.0 US qt)
	filter change	3.6 L (3.8 US qt)
	overhaul	3.8 L (4.0 US qt)
Secondary bevel gear oil		340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil		280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure		0.6 kg/cm² (8.5 psi)
Front fork oil		251 ml (8.48 US oz) in each leg

* Specifications subject to change without notice.

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve Dia.	IN.	35.9 – 36.1 (1.41 – 1.42)	———
	EX.	29.9 – 30.1 (1.18 – 1.19)	———
Valve lift	IN.	8.0 (0.31)	———
	EX.	7.5 (0.30)	———
Valve clearance or Tappet clearance (when cold)	IN.& EX.	0.03 – 0.08 (0.001 – 0.003)	———
Valve guide to Valve stem clearance	IN.	0.025 – 0.055 (0.0009 – 0.0022)	0.35 (0.014)
	EX.	0.040 – 0.070 (0.0016 – 0.0028)	0.35 (0.014)
Valve guide I.D.	IN.& EX.	7.000 – 7.015 (0.2756 – 0.2762)	———
Valve stem O.D.	IN.	6.960 – 6.975 (0.2740 – 0.2746)	———
	EX.	6.945 – 6.960 (0.2734 – 0.2740)	———
Valve stem runout	IN.& EX.	———	0.05 (0.002)
Valve head thickness	IN.& EX.	———	0.5 (0.02)
Valve seat width	IN. & EX.	1.0 – 1.2 (0.04 – 0.05)	
Valve head radial runout	IN.& EX.	———	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	———	33.9 (1.33)
	OUTER	———	41.3 (1.63)
Valve spring tension (IN. & EX.)	INNER	29.3 – 34.0 kg (64.59 – 74.96 lbs) at length 23 mm (0.91 in)	———
	OUTER	50.4 – 58.3 kg (111.11 – 128.53 lbs) at length 27 mm (1.06 in)	———

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.320 – 36.360 (1.4299 – 1.4315)	36.020 (1.4181)
	EX.	35.770 – 35.810 (1.4083 – 1.4098)	35.470 (1.3965)
Camshaft journal oil clearance	IN. & EX.	0.037 – 0.065 (0.0015 – 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012 – 22.025 (0.8666 – 0.8671)	———
Camshaft journal O.D.	IN. & EX.	21.960 – 21.975 (0.8646 – 0.8652)	———
Cahmshaft runout	IN. & EX.	———	0.1 (0.004)
Cam chain 20 pitch length		———	157.80 (6.213)
Cam chain pin (at arrow "3")		20 th pin	———
Cylinder head distortion		———	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	9 – 12 kg/cm² (128 – 171 psi)			7 kg/cm² (100 psi)
Compression pressure difference	———			12 kg/cm² (28 psi)
Piston to Cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)			0.120 (0.0047)
Cylinder bore	69.000 – 69.015 (2.7165 – 2.7171)			69.080 (2.7197)
Piston Dia.	68.945 – 68.960 (2.7144 – 2.7150) Measure the 15 (0.59) from piston skirt end.			68.880 (2.7118)
Cylinder distortion	———			0.2 (0.008)
Piston ring free end gap	1st	N	Approx. 9.0 (0.35)	7.2 (0.28)
	2nd	N	Approx. 9.5 (0.37)	7.6 (0.30)
Piston ring end gap	1st		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
	2nd		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
Piston ring groove clearance	1st		———	0.18 (0.0071)
	2nd		———	0.15 (0.0059)
Piston ring groove width	1st		1.21 – 1.23 (0.047 – 0.048)	———
	2nd		1.21 – 1.23 (0.047 – 0.048)	———
	Oil		2.51 – 2.53 (0.099 – 0.100)	———
Piston ring thickness	1st		1.175 – 1.190 (0.0463 – 0.0469)	———
	2nd		1.170 – 1.190 (0.0461 – 0.0469)	———
Piston pin bore I.D.	16.002 – 16.008 (0.6300 – 0.6302)			16.030 (0.6311)
Piston pin O.D.	15.995 – 16.000 (0.6297 – 0.6300)			15.980 (0.6291)

CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.006 – 16.014 (0.6302 – 0.6305)	16.040 (0.6315)
Conrod deflection	———	3.0 (0.12)
Conrod big end side clearance	0.10 – 0.65 (0.004 – 0.026)	1.0 (0.039)
Crankshaft runout	———	0.05 (0.002)

OIL PUMP

Unit: mm (in)

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	———
Oil pressure (at 60° C, 140° F)	Above 0.1 kg/cm² (1.4 psi) Below 0.5 kg/cm² (7.1 psi) at 3 000 r/min.	———
Tip clearance	———	0.20 (0.008)
Outer rotor clearance	———	0.25 (0.010)
Side clearance	———	0.15 (0.006)

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2 – 3 (0.08 – 0.12)	———
Drive plate thickness	2.7 – 2.9 (0.106 – 0.114)	2.4 (0.094)
Drive plate claw width	11.8 – 12.0 (0.46 – 0.47)	11.0 (0.43)
Driven plate thickness	2.0 ± 0.06 (0.08 ± 0.002)	———
Driven plate distortion	———	0.1 (0.004)
Clutch spring free length	———	38.5 (1.52)

TRANSMISSION

Unit: mm (in)

ITEM	STANDARD		LIMIT
Primary reduction	1.775 (87 / 49)		———
Secondary reduction	1.062 (17 / 16)		———
Final reduction	3.090 (34 / 11)		———
Gear ratios	Low	2.500 (35 / 14)	———
	2nd	1.777 (32 / 18)	———
	3rd	1.380 (29 / 21)	———
	4th	1.125 (27 / 24)	———
	Top	0.961 (25 / 26)	———
Shift fork to Groove clearance	0.4 – 0.6 (0.016 – 0.024)		0.8 (0.031)
Shift fork groove width	5.45 – 5.55 (0.215 – 0.219)		———
Shift fork thickness	4.95 – 5.05 (0.195 – 0.199)		———

SHAFT DRIVE

Unit: mm (in)

ITEM	STANDARD	LIMIT
Secondary bevel gear backlash	0.08 – 0.13 (0.003 – 0.005)	———
Final bevel gear backlash	0.03 – 0.64 (0.001 – 0.025)	———
Secondary drive bevel gear preload	3 – 5 kg·cm (2.60 – 4.35 lb·in)	———
Secondary driven bevel gear preload	4 – 7 kg·cm (3.45 – 6.05 lb·in)	———
Final drive bevel gear preload	4 – 8 kg·cm (3.45 – 6.95 lb·in)	———

CARBURETOR

Unit: mm (in)

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS32SS
Bore size		32 (1.26)
I. D. No.		45110
Idle r/min.		1 050 ± 100 r/min.
Fuel level		5.0 ± 0.5 (0.20 ± 0.02)
Float height		22.4 ± 1.0 (0.88 ± 0.04)
Main jet	(M. J.)	# 115
Main air jet	(M. A. J.)	1.7
Jet needle	(J. N.)	5D50
Needle jet	(N. J.)	X-5
Pilot jet	(P. J.)	# 40
By pass	(B. P.)	1.0, 0.8, 0.8
Pilot outlet	(P. O.)	0.7
Valve seat	(V. S.)	2.0
Starter jet	(G. S.)	# 32.5
Pilot screw	(P. S.)	PRE-SET
Throttle cable play		0.5 – 1.0 (0.02 – 0.04)

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		
Ignition timing	17° B. T. D. C. Below 1 500 ± 150 r/min. and 37° B. T. D. C. Above 2 350 ± 150 r/min.		
Firing order	1, 2, 4, 3		
Spark plug	Type	NGK : B8ES N. D. : W24ES-U	
	Gap	0.6 – 0.8 (0.024 – 0.031)	
Spark performance	Over 8 (0.3) at 1 atm		
Signal coil resistance	Approx.	290 – 360 Ω	BI-G
Ignition coil resistance	Primary	O/W – W Approx. 3 – 5Ω	
	Secondary	Plug cap – Plug cap Approx. 31 – 33 kΩ	
Generator No-Load voltage	More than 80 V (AC) at 5 000 r/min.		
Regulated voltage	14.0 – 15.5 V at 5 000 r/min.		
Starter motor	Brush length	Limit: 6 (0.24)	
	Commutator under cut	Limit: 0.2 (0.008)	
Starter relay resistance	3 – 4 Ω		
Battery	Type designation	YB14L – A2	
	Capacity	12V 50.4kC (14Ah)/10HR	
	Standard electrolyte S. G.	1.28 at 20°C (68°F)	
Fuse size	Headlight	10A	
	Turn signal	10A	
	Ignition	10A	
	Main	15A	
	Output terminal	10A	

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height		20 (0.8)	—
Brake disc thickness	Front	5.0 ± 0.2 0.2 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder cylinder bore	Front	15.870 – 15.913 (0.6248 – 0.6265)	—
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston dia.	Front	15.827 – 15.854 (0.6231 – 0.6242)	—
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	—
Brake caliper cylinder bore	Front	38.180 – 38.256 (1.5031 – 1.5061)	—
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	—
Brake caliper piston dia.	Front	38.098 – 38.148 (1.4999 – 1.5019)	—
	Rear	38.098 – 38.148 (1.4999 – 1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	3.50H19 4PR	—
	Rear	4.50H17 4PR	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	160 (6.3)	———
Front fork spring free length	———	416 (16.4)
Front fork oil level	140 (5.5)	———
Front fork air pressure	0.6 kg/cm^2 (8.5 psi)	———
Rear wheel travel	100 (3.9)	———

FUEL + OIL + CAPACITY

Unit: mm (in)

ITEM	SPECIFICATION	
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve	22 L (5.8 US gal)	
reserve	4.2 L (4.4 US qt)	
Engine oil type	SAE 10W/40	
Engine oil capacity	Change	2 800 ml (3.0 US qt)
	Filter change	3 600 ml (3.8 US qt)
	Overhaul	3 800 ml (4.0 US qt)
Front fork oil type	SAE 10W/20	
Front fork oil capacity (each leg)	251 ml (8.48 US oz)	
Bevel gear oil type	Hypoid Gear oil SAE 90, API grade GL-5	
Bevel gear oil capacity	Secondary	340 – 400 ml (11.5 – 13.5 US oz)
	Final	280 – 330 ml (9.5 – 11.2 US oz)
Brake fluide type	DOT3 or DOT4	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING				CONTINUOUS HIGH SPEED RIDING			
	SORO RIDING		DUAL RIDING		SOLO RIDING		DUAL RIDING	
	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi
FRONT	1.75	25	1.75	25	2.00	28	2.00	28
REAR	2.00	28	2.25	32	2.25	32	2.80	40

WATTAGE

Unit: W

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32 cp)
Turn signal light		23 (32 cp)
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
License light		8

TORQUE TABLE

ENGINE

ITEM	kg·m	lb·ft
Cylinder head cover bolt	0.6 - 1.0	4.5 - 7.0
Cylinder head bolt	0.7 - 1.1	5.0 - 8.0
Cylinder head nut	3.5 - 4.0	25.5 - 29.0
Camshaft bearing cap bolt	0.8 - 1.2	6.0 - 8.5
Camshaft sprocket bolt	0.8 - 1.1	6.0 - 8.0
Cam chain idler bolt	0.6 - 1.0	4.5 - 7.0
Cam chain guide No. 2 bolt	0.4 - 0.7	3.0 - 5.0
Generator roter bolt	6.0 - 7.0	43.5 - 50.5
Advance governor bolt	1.8 - 2.3	13.0 - 16.5
Starter motor bolt	0.4 - 0.7	3.0 - 5.0
Starter clutch bolt	1.5 - 2.0	11.0 - 14.5
Clutch sleeve hub nut	5.0 - 7.0	36.0 - 50.5
Clutch spring bolt	1.1 - 1.3	8.0 - 9.5
Clutch release arm bolt	0.6 - 1.0	4.5 - 7.0
Oil strainer screw	0.6 - 1.0	4.5 - 7.0
Gear shifting cam stopper spring holder bolt	1.8 - 2.8	13.0 - 20.0
Gear shift arm stopper bolt	1.5 - 2.3	11.0 - 16.5
Crankcase bolt (6 mm)	0.6 - 1.0	4.5 - 7.0
Crankcase bolt (8 mm)	1.8 - 2.2	13.0 - 16.0
Engine mounting nut (10 mm)	2.5 - 4.5	18.0 - 32.5
Engine mounting nut (12 mm)	4.5 - 7.0	32.5 - 50.5
Exhaust pipe bolt	0.9 - 1.4	6.5 - 10.0
Muffler bolt	1.8 - 2.8	13.0 - 20.0
Gear shift lever bolt	1.3 - 2.3	9.5 - 16.5
Secondary drive gear nut	12.0 - 15.0	87.0 - 108.5
Secondary driven gear nut	9.0 - 11.0	65.0 - 79.5
Secondary drive housing bolt	2.0 - 2.6	14.5 - 19.0
Secondary driven housing bolt	2.0 - 2.6	14.5 - 19.0

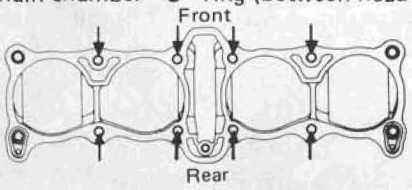
CHASSIS

ITEM	kg·m	lb·ft
Handlebar clamp bolt	1.2 - 2.0	8.5 - 14.5
Steering stem upper clamp bolt	1.5 - 2.5	11.0 - 18.0
Front fork upper bracket bolt (R,L)	2.0 - 3.0	14.5 - 21.5
Front fork lower bracket bolt (R,L)	1.5 - 2.5	11.0 - 18.0
Steering stem head nut	3.5 - 5.0	25.5 - 36.0
Front fork axle holder nut	1.5 - 2.5	11.0 - 18.0
Front axle shaft nut	3.6 - 5.2	26.0 - 37.5
Swinging arm pivot bolt	0.35 - 0.45	2.5 - 3.0
Swinging arm pivot nut	11.0 - 13.0	79.5 - 94.0
Rear torque link nut	2.0 - 3.0	14.5 - 21.5
Rear axle nut	5.0 - 8.0	36.0 - 58.0
Rear shock absorber nut	2.0 - 3.0	14.5 - 21.5
Footrest bolt	2.7 - 4.3	19.5 - 31.0
Front brake caliper mounting bolt	2.5 - 4.0	18.0 - 29.0
Front and rear brake disc plate bolt	1.5 - 2.5	11.0 - 18.0
Front brake caliper axle bolt	1.5 - 2.0	11.0 - 14.5
Front brake master cylinder mounting bolt	0.5 - 0.8	3.5 - 6.0
Front and rear brake hose union bolt	1.3 - 1.8	9.5 - 13.0
Front and rear brake oil bleeder bolt	0.6 - 0.9	4.5 - 6.5
Rear brake caliper mounting bolt	2.0 - 3.0	14.5 - 21.5
Rear brake caliper axle bolt	2.5 - 3.5	18.0 - 25.5
Rear brake master cylinder mounting bolt	1.5 - 2.5	11.0 - 18.0
Final drive gear nut	9.0 - 11.0	65.0 - 79.5
Final drive gear housing nut	3.5 - 4.5	25.5 - 32.5
Propeller shaft bolt	2.5 - 3.0	18.0 - 21.5
Final gear bearing case bolt	2.0 - 2.6	14.5 - 19.0
Final gear case shock mount stud bolt	9.0 - 11.0	65.0 - 79.5
Final case oil filler plug	2.0 - 3.0	14.5 - 21.5

SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GS850G, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

Material	Part
 99000-32040 SUZUKI THREAD LOCK CEMENT	* Oil filter cover nut . . . . . 3 pcs * Camshaft end cap screw . . . . . 8 pcs * Front fork allen bolt . . . . . 2 pcs * Carburetor adjuster bracket screw. . . . . 2 pcs * Carburetor plate screw . . . . . 8 pcs * Carburetor starter shaft screw . . . . . 4 pcs
 99000-32050 SUZUKI THREAD LOCK CEMENT "1342"	* Gearshift cam guide screw. . . . . 2 pcs * Gearshift pawl screw . . . . . 2 pcs * Counter shaft B/G retainer screw . . . . . 3 pcs * Drive shaft plate screw . . . . . 3 pcs * Generator startor screw . . . . . 3 pcs * Generator lead wire guide screw . . . . . 3 pcs * Engine oil pump screw . . . . . 4 pcs * Oil gallery plate screw . . . . . 3 pcs * Secondary drive bevel gear assy set bolt . . . . . 4 pcs * Secondary driven bevel gear assy set bolt . . . . . 4 pcs * Final bevel gear bearing holder screw. . . . . 3 pcs * Final bearing case bolt . . . . . .10 pcs
 99000-32020 SUZUKI THREAD LOCK CEMENT SUPER "1333B"	* Cam sprocket bolt . . . . . 4 pcs * Thread portion of secondary driven gear * Thread portion of final drive gear * Propeller shaft joint bolt. . . . . 4 pcs * Stater clutch allen bolt . . . . . 3 pcs * Cam chain guide bolt . . . . . 3 pcs * Gearshift stopper. . . . . 1 pc

Material	Part
 99104-31140 SUZUKI BOND No. 1207B	* Cylinder stud bolt . . . . . 8 pcs (Apply a small quantity to the threads of cylinder stud bolts.) Cam chain chamber "O" ring (between head and cylinder)  * Mating surfaces of upper and lower crank case. * Final gear case * Joint portion of rear swinging arm and final gear case.
 99000-25100 SUZUKI SILICUNE GREASE	* Apply to caliper axle shaft
 99000-25140 SUZUKI MOLY PASTE	* Valve stem * Cam shaft journal * Chain tensioner adjuster shaft * Counter shaft washer * Outer counter shaft * Input cam dog

PERIODIC MAINTENANCE

IMPORTANT: The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also enhance the reliability and performance of the motorcycle.

NOTE:
More frequent servicing may be performed on motorcycles that are used under extreme severe comditions, however, it is not necessary to ensure emission level compliance.

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and to maintain proper emission levels. Mileages are expressed in terms of kilometers, miles and time for your convenience.

PERIODIC MAINTENANCE SCHEDULE

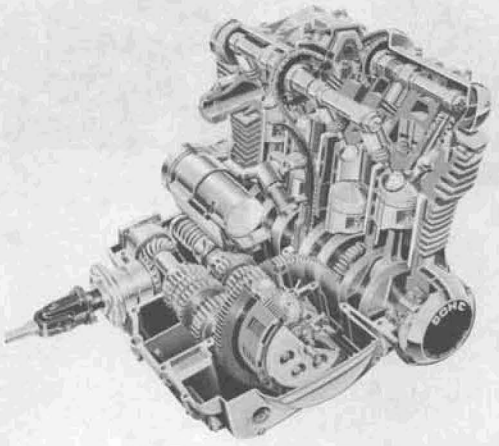
INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST						
	Mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		–	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		–	C	C	C	C
Tappet clearance		I	I	I	I	I
Spark plug		–	C	R	C	R
Fuel line		Replace every two years				
Engine oil and oil filter		R	R	R	R	R
Engine idle speed		I	I	I	I	I
Clutch		I	I	I	I	I
Secondary and Final gear oil		Change oil at initial 600 miles (1 000 km) every 7 500 miles (12 000 km)				
Brake hose		Replace every two years				
Brake		I	I	I	I	I
Tires		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front forks		–	–	I	–	I
		Check air pressure every 6 months.				

NOTE: T = Tighten, I = Inspect, R = Replace, C = Clean

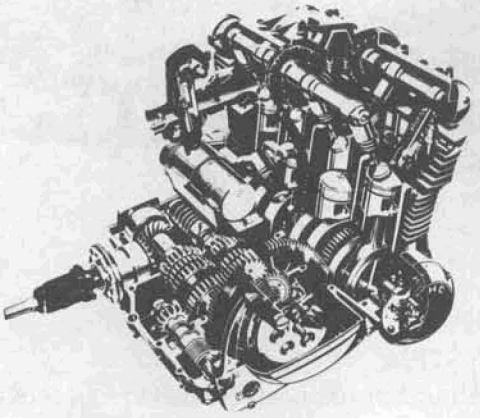
MODIFICATIONS

ENGINE

- On the engine starter system, the combines electric and kick starter system has been replaced by the electric starter system; that is, the kick starter system is discontinued. As a result, generator has been replaced by high performance type.

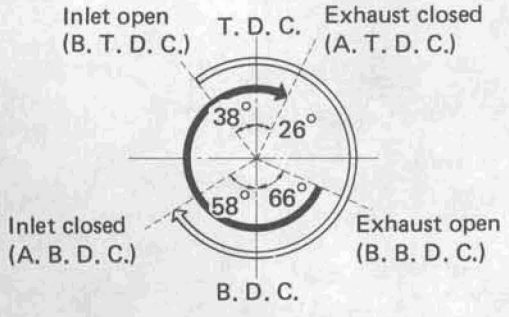


GS850GT MODEL

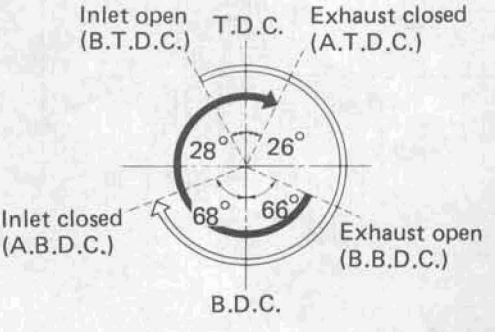


GS850GN MODEL

- To make the valve timing better suited to the engine, the mounting angles of both intake cam shaft and intake cam shaft sprocket are partly changed. The result is the following valve timing.

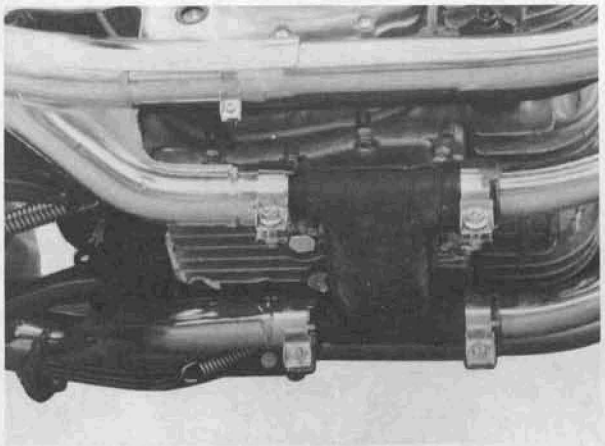


GS850GT MODEL

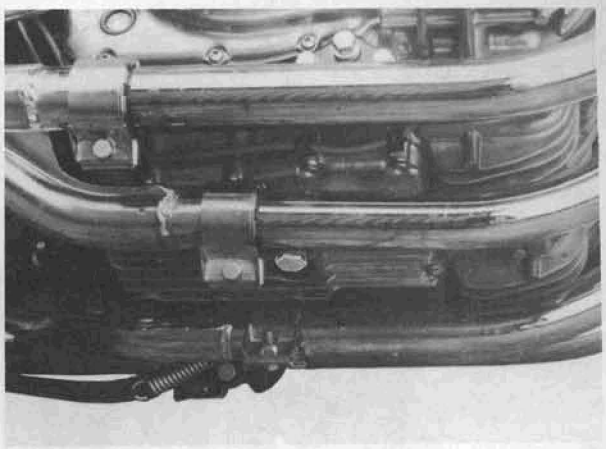


GS850GN MODEL

- No. 2 and No. 3 exhaust pipes are connected by a pre-muffler.



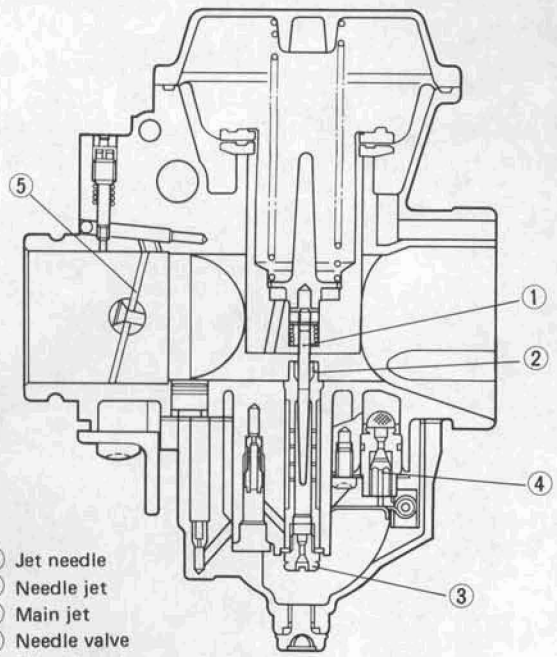
GS850GT MODEL



GS850GN MODEL

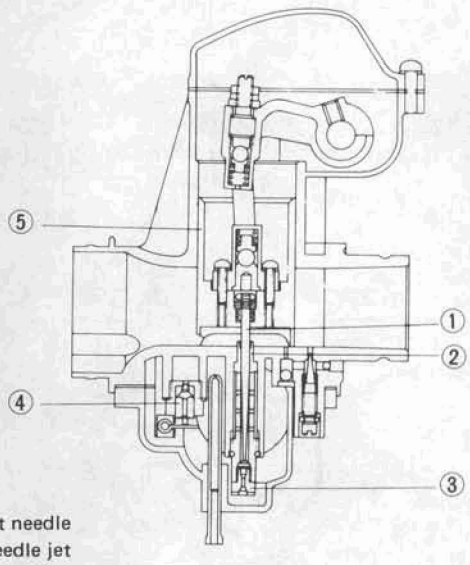
FUEL SYSTEM

- The carburetor has been changed from MIKUNI VM26SS to MIKUNI BS32SS.



① Jet needle
② Needle jet
③ Main jet
④ Needle valve
⑤ Throttle valve

GS850GT MODEL

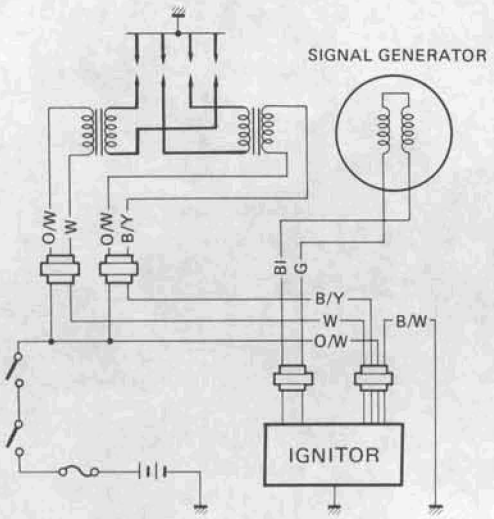


① Jet needle
② Needle jet
③ Main jet
④ Needle valve
⑤ Throttle valve

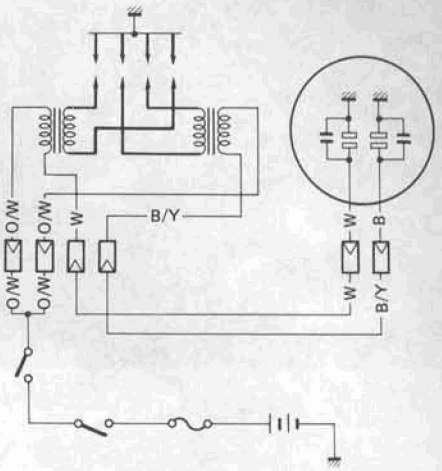
GS850GN MODEL

ELECTRICAL

- The ignition system has been changed from the battery ignition system to the maintenance-free transistorized ignition system.



GS850GT MODEL



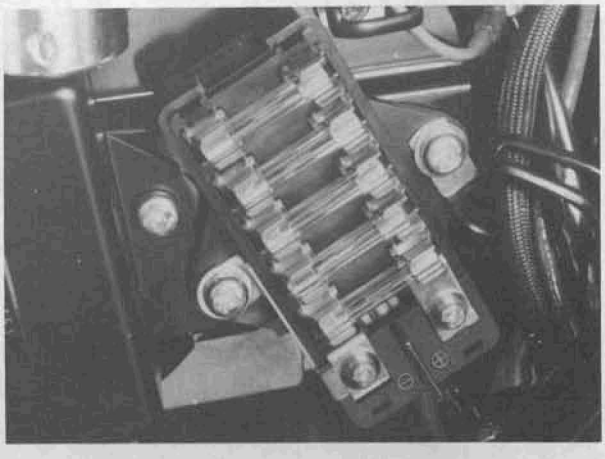
GS850GN MODEL

- The left handlebar switch has been changed as shown below:

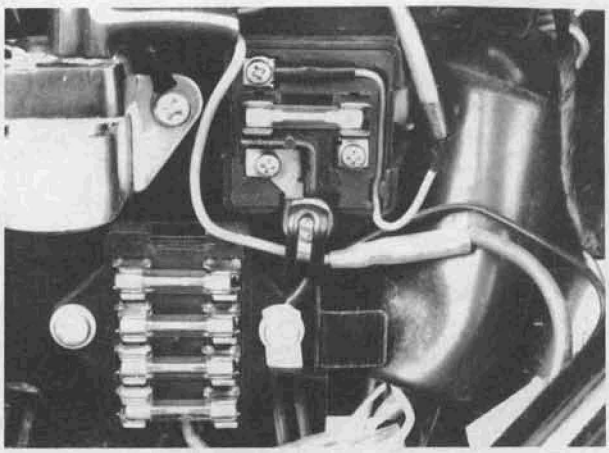
GS850GT MODEL

GS850GN MODEL

- The fuse box and output terminal have been changed from the separate type to the combined type.

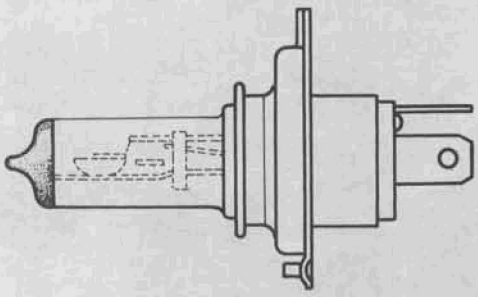


GS850GT MODEL

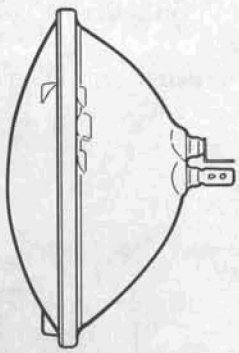


GS850GN MODEL

- The headlight bulb has been changed to the halogen type.



GS850GT MODEL



GS850GN MODEL

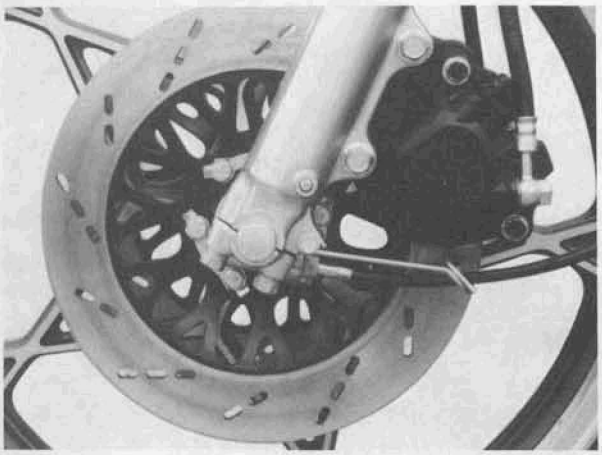
CHASSIS

- The front master cylinder cap has been changed from a screwing-in type to a 4-screw fastening type.

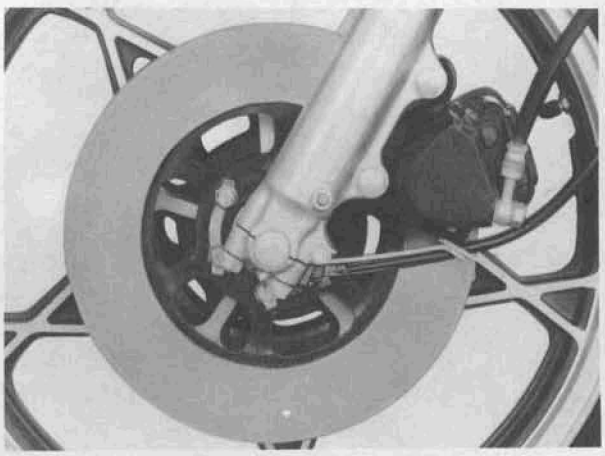
GS850GT MODEL

GS850GN MODEL

- The front and rear brake disc plates are newly provided with holes, and the resultant larger surface area provided better heat dissipation for improved braking efficiency.

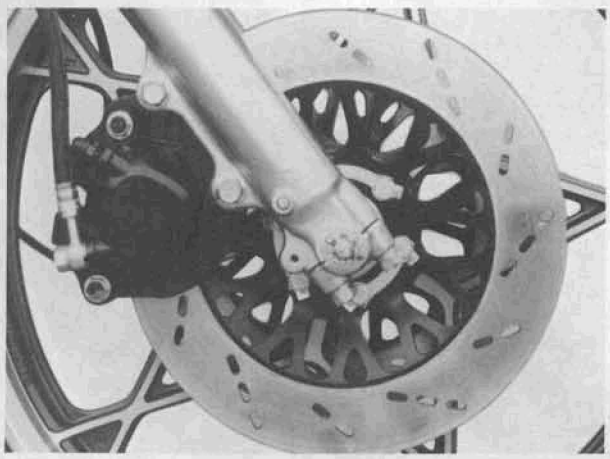


GS850GT MODEL

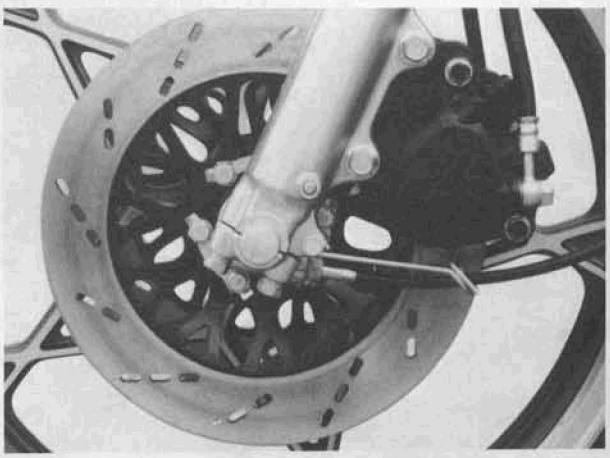


GS850GN MODEL

CAUTION:
Be careful not to reverse the right and left front disc plates.



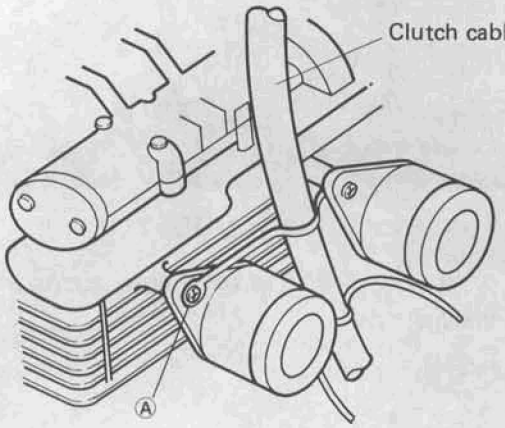
Right front disc plate



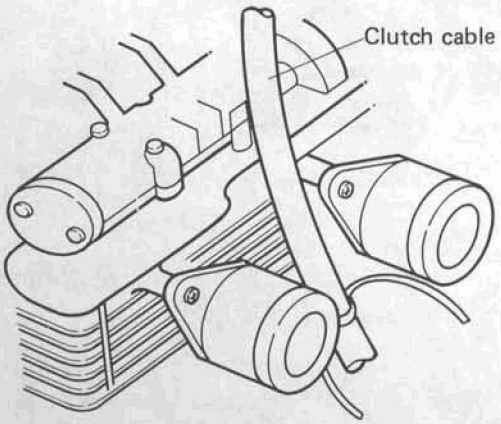
Left front disc plate

- As shown below, cable guides are newly added to better hold the clutch cable.

CAUTION:
- Whenever the clutch cable, carburetor and cylinder has been reinstalled in relation to the routing of the clutch cable, make sure that the clutch cable is correctly routed through two guides and between the cylinders.
- When reinstalling screw Ⓐ, coat it with THREAD LOCK CEMENT (99000-32040).

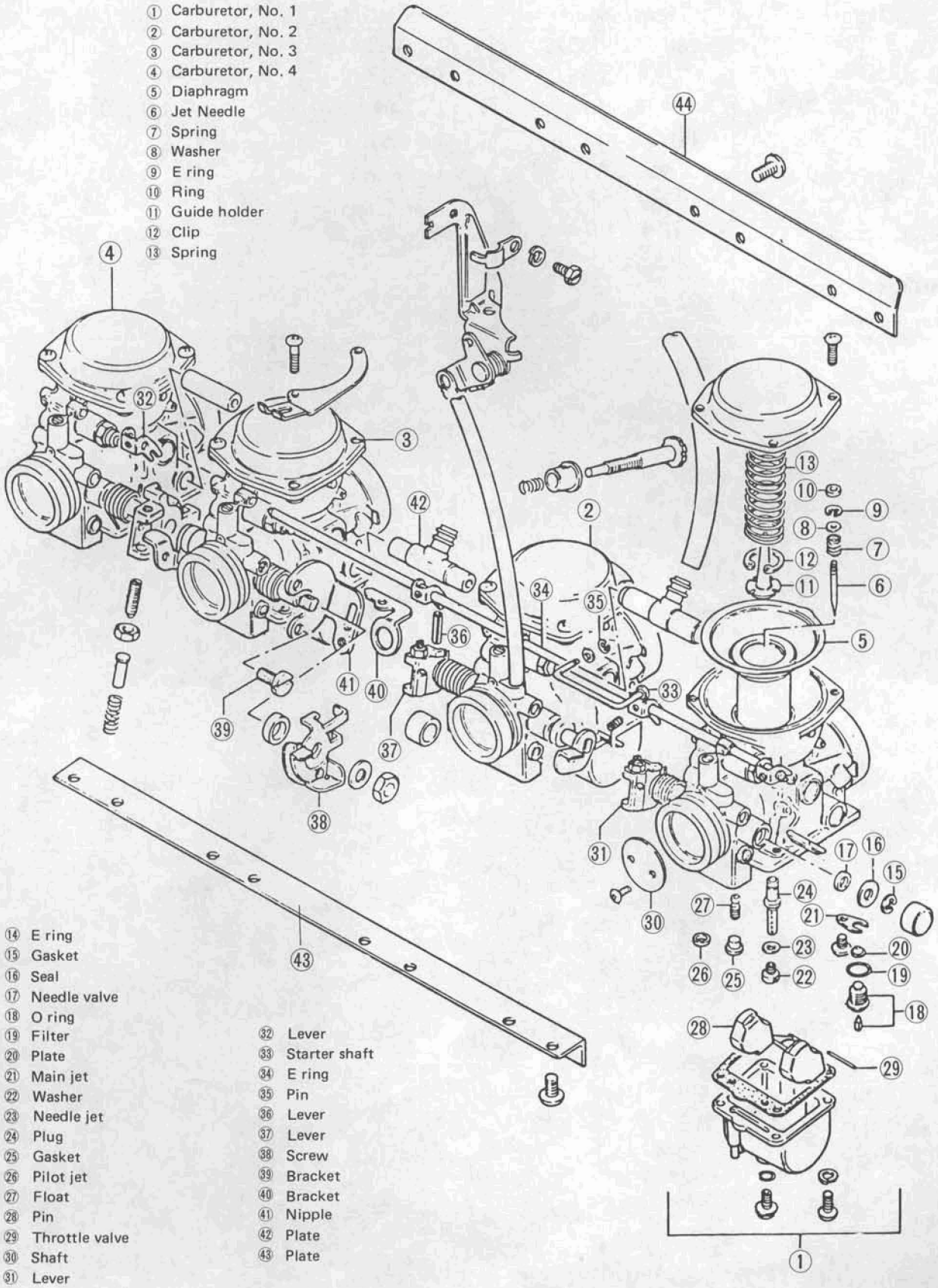


GS850GT MODEL



GS850GN MODEL

CARBURETOR


① Carburetor, No. 1
② Carburetor, No. 2
③ Carburetor, No. 3
④ Carburetor, No. 4
⑤ Diaphragm
⑥ Jet Needle
⑦ Spring
⑧ Washer
⑨ E ring
⑩ Ring
⑪ Guide holder
⑫ Clip
⑬ Spring
⑭ E ring
⑮ Gasket
⑯ Seal
⑰ Needle valve
⑱ O ring
⑲ Filter
⑳ Plate
㉑ Main jet
㉒ Washer
㉓ Needle jet
㉔ Plug
㉕ Gasket
㉖ Pilot jet
㉗ Float
㉘ Pin
㉙ Throttle valve
㉚ Shaft
㉛ Lever
㉜ Lever
㉝ Starter shaft
㉞ E ring
㉟ Pin
㊱ Lever
㊲ Lever
㊳ Screw
㊴ Bracket
㊵ Bracket
㊶ Nipple
㊷ Plate
㊸ Plate
㊹

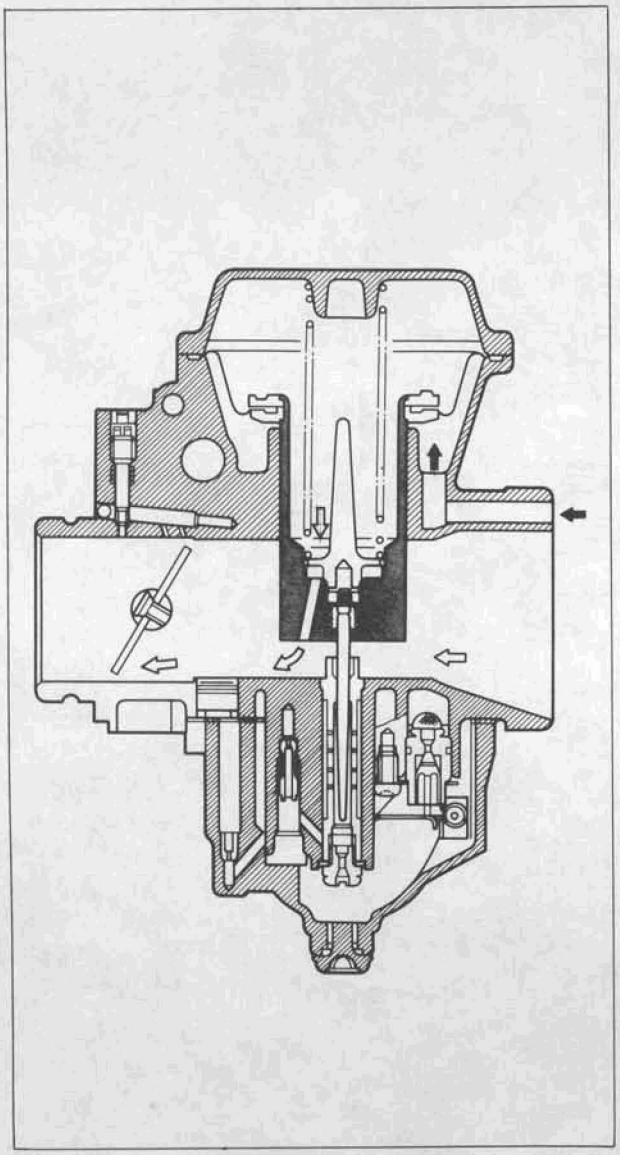
SPECIFICATIONS

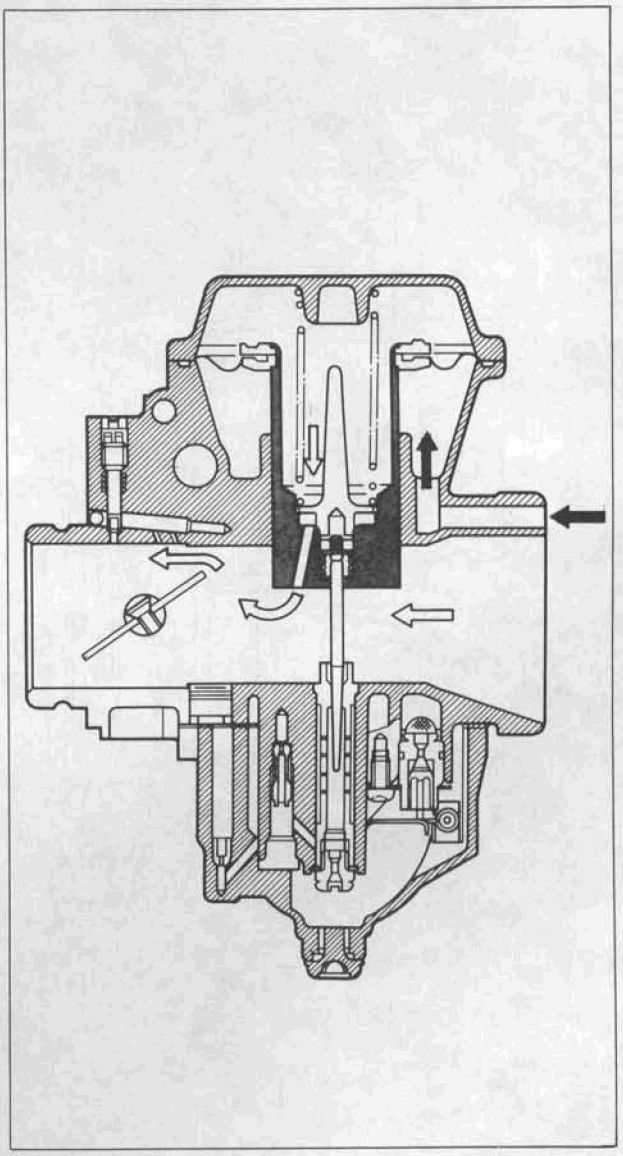
Item	Specification	Item	Specification
Type	MIKUNI BS32SS	Needle jet	X–5
Bore size	32 mm (1.26 in)	Pilot jet	#40
I.D. No.	45110	By pass	1.0, 0.8, 0.8
Idle r/min	1 050 ± 100 r/min	Pilot outlet	0.7
Fuel level	50 ± 0.5 mm (0.20 ± 0.02 in)	Valve seat	2.0
		Starter jet	# 32.5
Float height	22.4 ± 1.0 mm (0.88 ± 0.04 in)	Pilot screw	PRE-SET
Main jet	# 115		
Jet needle	5D50		

DIAPHRAGM AND PISTON OPERATION

The carburetor is of a variable-venturi type, whose venturi cross section area is increased or decreased automatically by the piston according to the vacuum present on the downstream side of the venturi. Vacuum is admitted into the diaphragm chamber through an orifice provided in the piston.

Rising vacuum overcomes the spring force, causing the piston to rise to increase the said area and thus to prevent the air velocity from increasing. Therefore, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing an optimum ratio of fuel to air in the mixture.



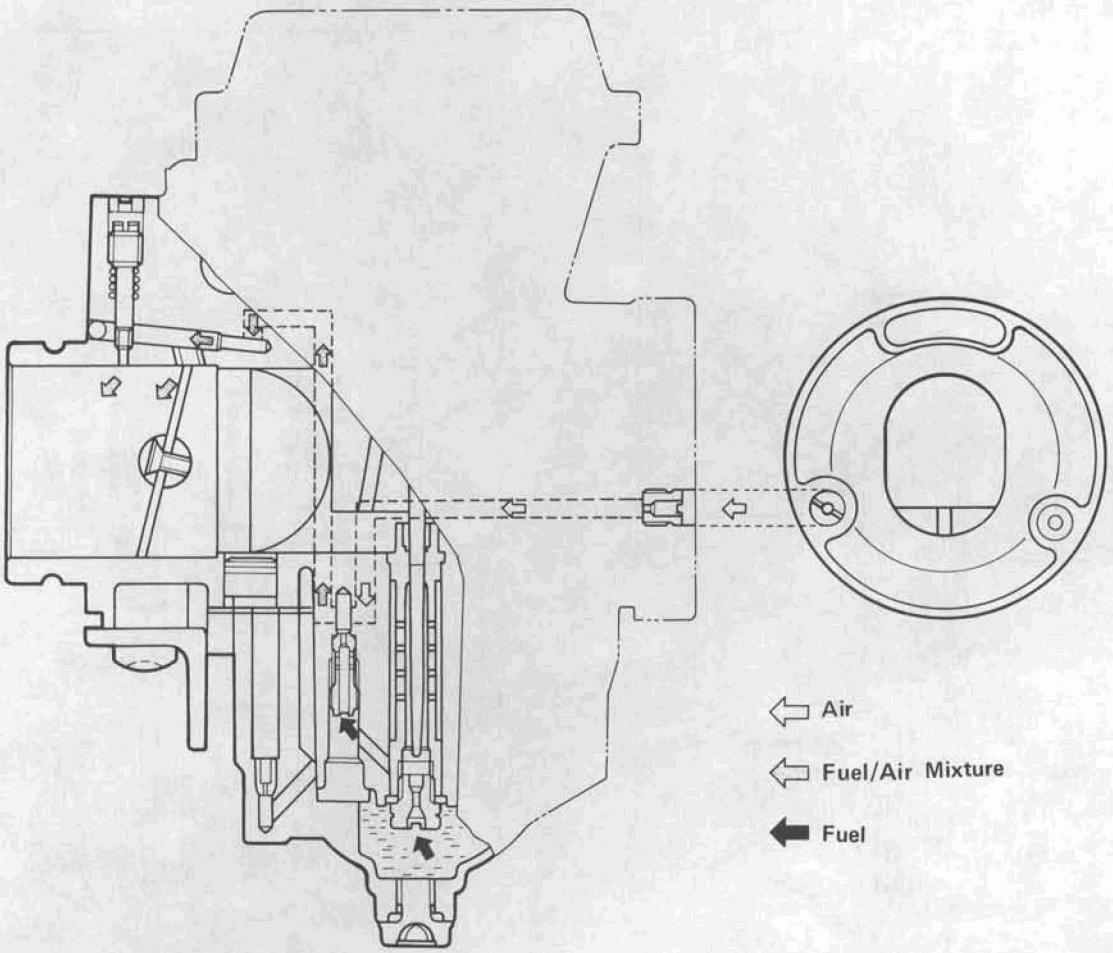


SLOW SYSTEM

This system supplies fuel during engine operation with throttle valve closed or slightly opened.

The fuel from float chamber is first passed through main jet and metered by pilot jet where it mixes with air coming in through pilot air jet.

This mixture, rich with fuel, then goes up through pilot pipe to pilot screw. A part of the mixture is discharged into the main bore out of bypass port. The remainder is then metered by pilot screw and sprayed out into the main bore through pilot outlet.



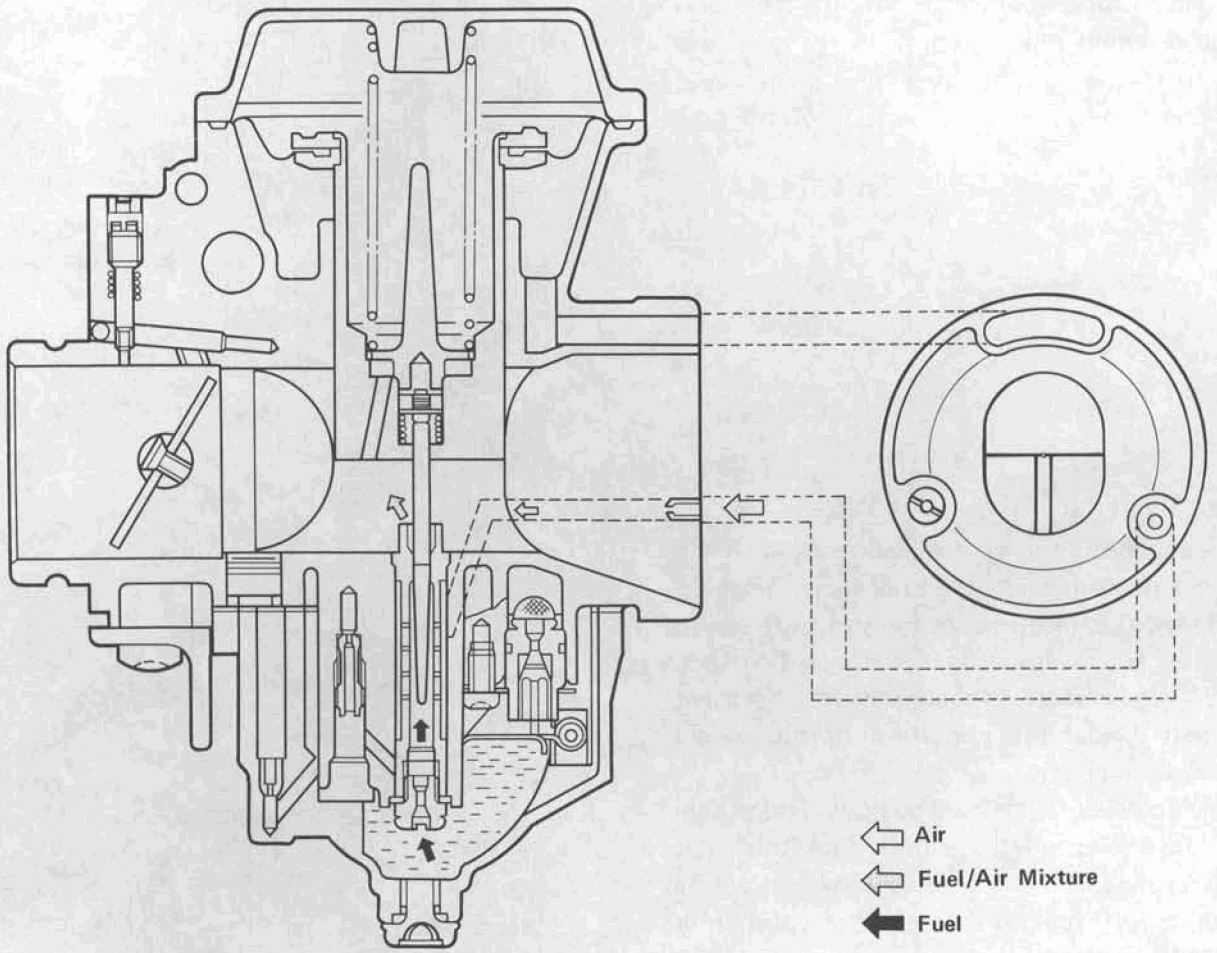
MAIN SYSTEM

As throttle valve is opened, engine speed rises, and this increases vacuum in the venturi. Consequently the piston valve moves upward.

Meanwhile, the fuel in float chamber is metered by main jet, and the metered fuel enters needle jet, in which it mixes with the air admitted through main air jet to form an emulsion.

The emulsified fuel then passes through the clearance between needle jet and jet needle and is discharged into the venturi, in which it meets main air stream drawn by the engine.

Mixture proportioning is accomplished in needle jet; the clearance through which the emulsified fuel must flow is either large or small depending ultimately on throttle position.

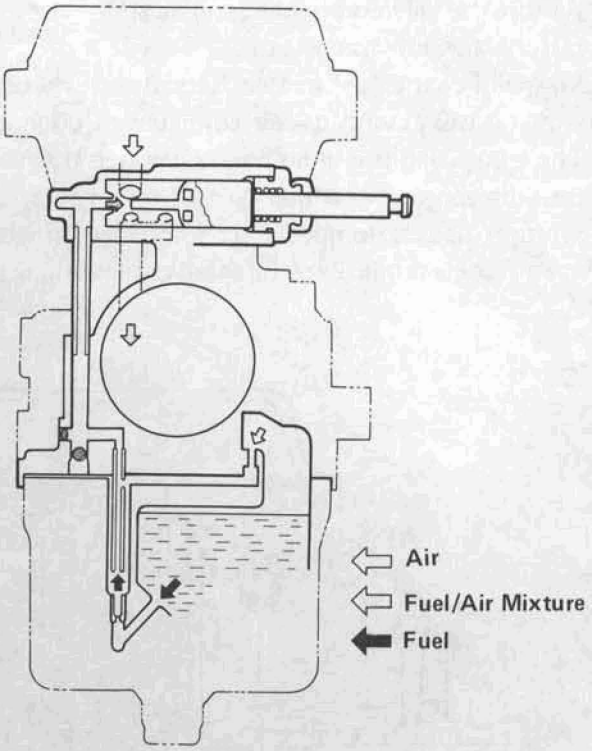


STARTER SYSTEM

Pulling up the choke knob slides starting plunger to draw fuel into the starter circuit from the float chamber through starter jet.

Starter jet meters this fuel, which then flows into starter pipe and mixes with the air coming from the float chamber. The mixture, rich in fuel content, reaches starting plunger and mixes again with the air coming through a passage extended from behind the diaphragm.

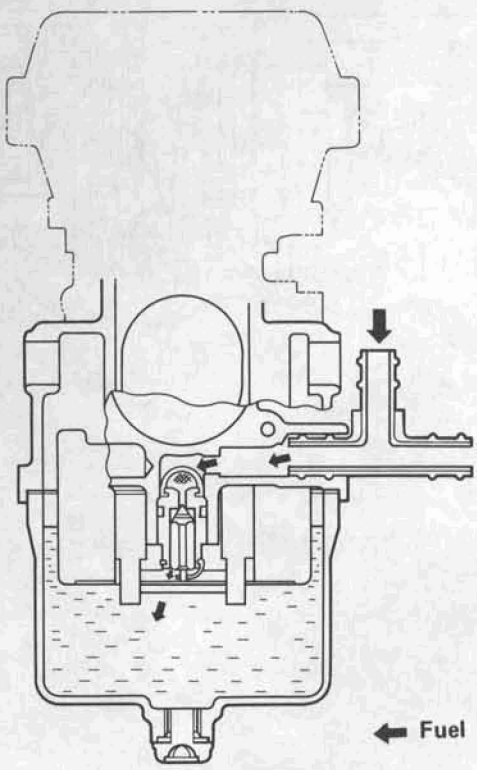
The two successive mixings of fuel with air are such that a proper fuel/air mixture for starting is produced when the mixture is sprayed out through starter outlet into the main bore.



FLOAT SYSTEM

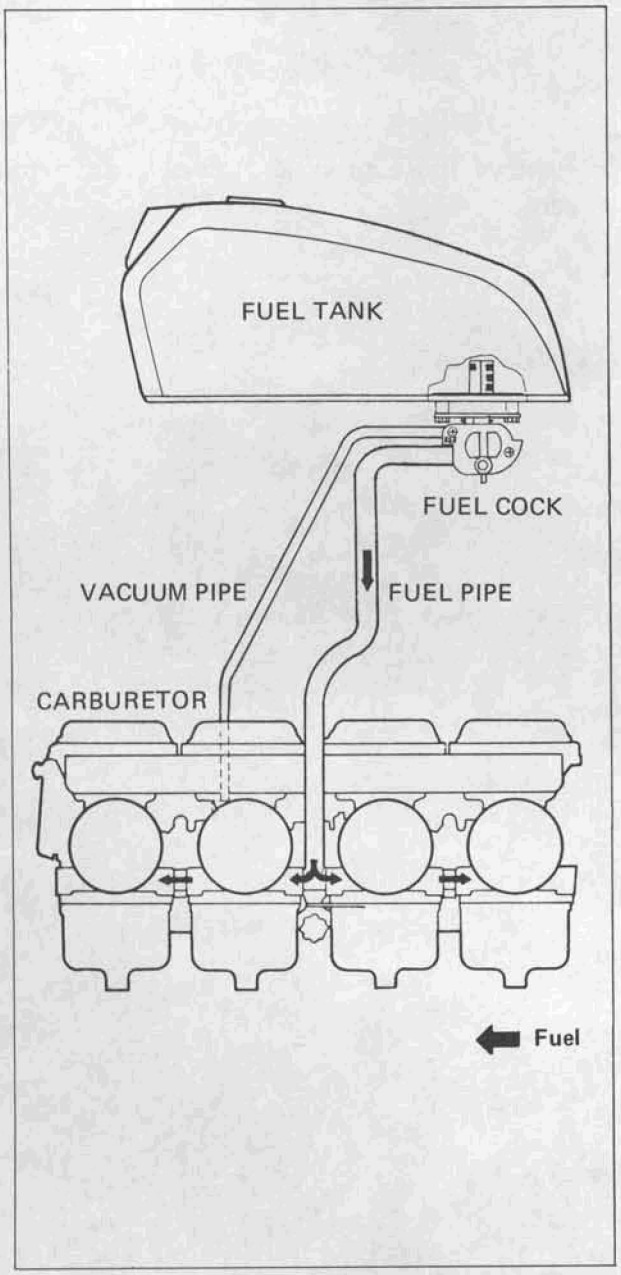
Floats and needle valve are associated with the same mechanism, so that, as the floats move up and down, the needle valve too moves likewise. When fuel level is up in float chamber, floats are up and needle valve remains pushed up against valve seat. Under this condition, no fuel enters into the float chamber.

As the fuel level falls, floats go down and needle valve unseats itself to admit fuel into the chamber. In this manner, needle valve admits and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber.



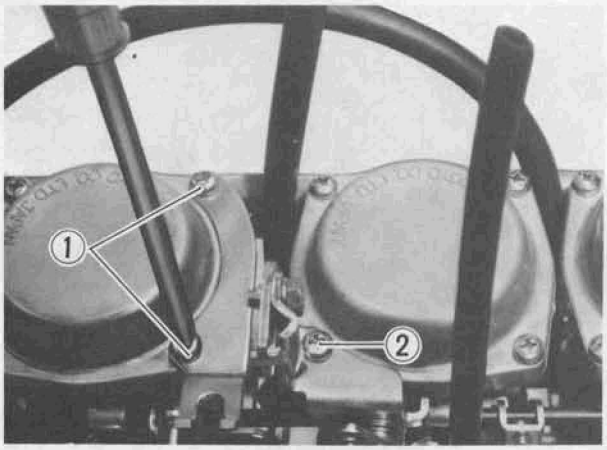
FUEL SYSTEM

When turning starter motor, negative pressure is generated in the combustion chamber. This nagative pressure works on the diaphragm of fuel cock through passageway provided in the carburetor main bore and vacuum pipe, and diaphragm builds up a negative pressure which is higher than the spring pressure. Fuel valve is forced to open due to diaphragm operation, and thus allow fuel to flow into carburetor float chamber.

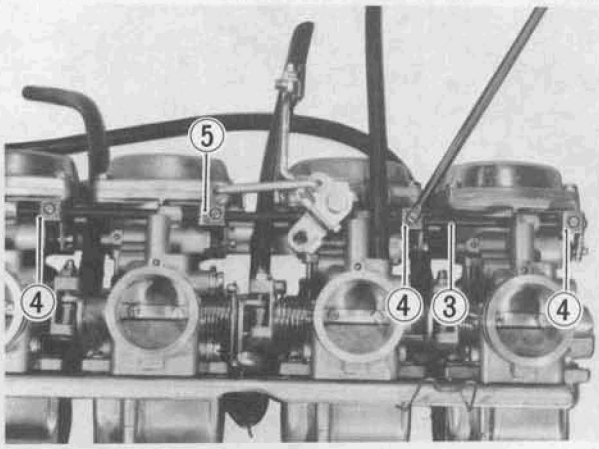


DISASSEMBLY

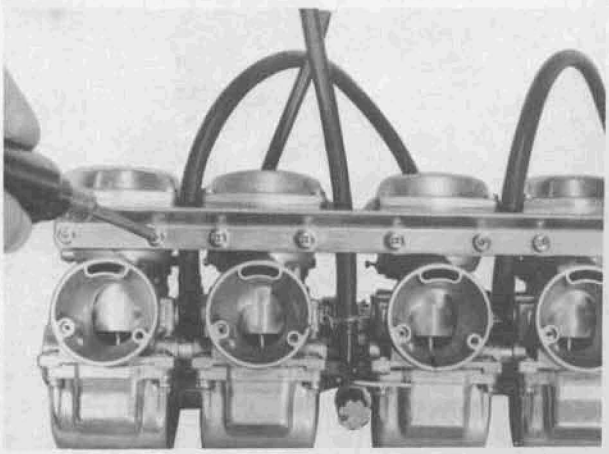
- Remove two throttle bracket screws ① and starter bracket screw ② , and remove bracket.



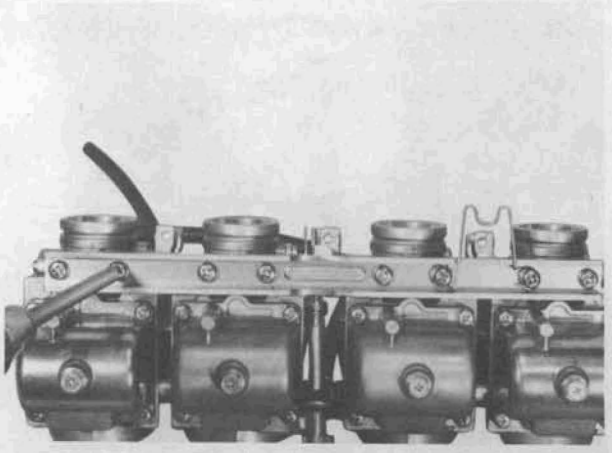
- Loosen four screws, and remove starter shaft ③ , three levers ④ and starter bracket and lever ⑤ .



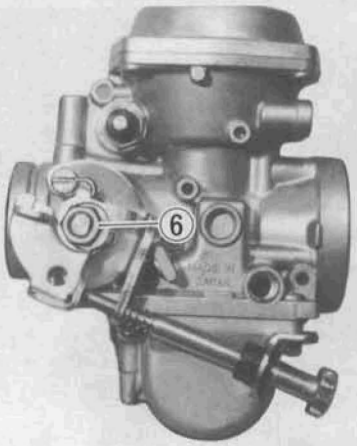
- Remove eight screws and remove the plate.



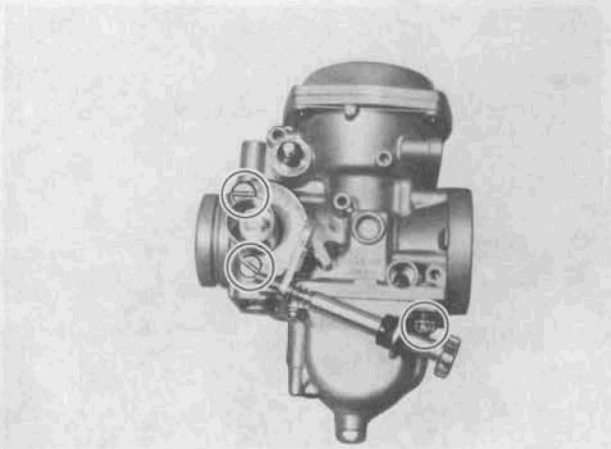
- Remove eight screws and remove the plate.



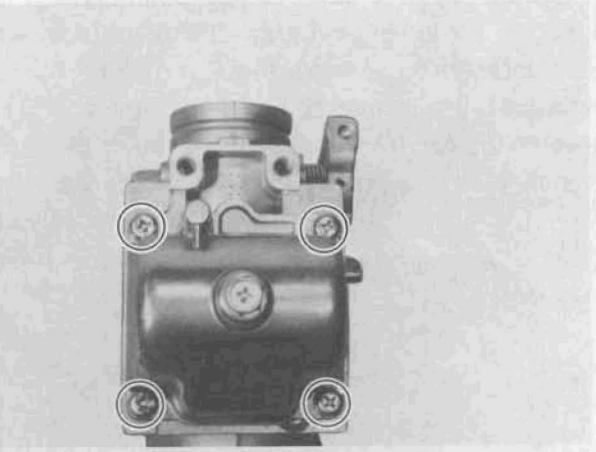
- Separate four carburetors, remove nut ⑥ and remove adjuster lever.



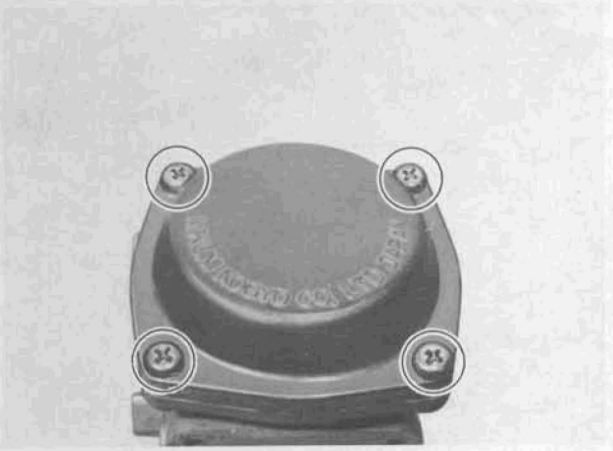
- Remove three screws, and remove adjuster bracket.



- Remove four screws and remove float chamber.



- Remove four screws and remove carburetor cap.

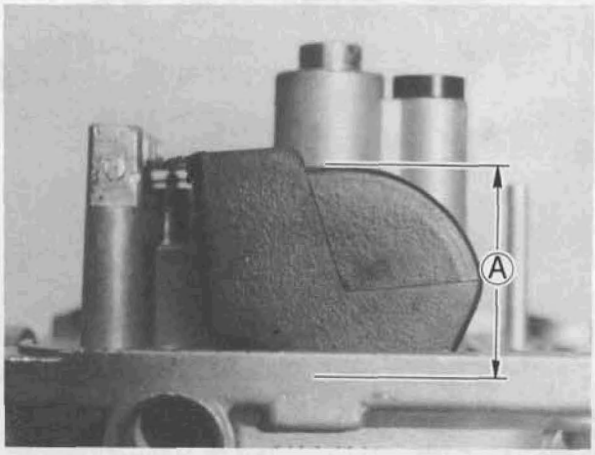


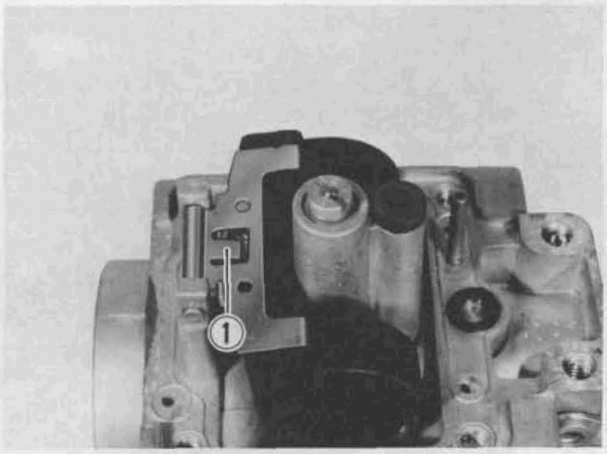
INSPECTION

FLOAT HEIGHT ADJUSTMENT

To check the float height, invert the carburetor body. With the float arm kept free, measure the height Ⓐ while float arm is just in contact with needle valve by using the caliper. Bend the tongue ① as necessary to bring the height Ⓐ to this value.

Float height Ⓐ	22.4 ± 1.0 mm (0.88 ± 0.04 in)



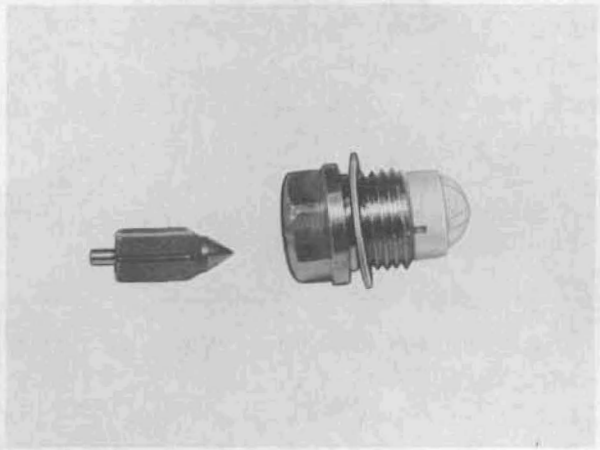


NOTE:
Be sure to remove the gasket before measuring the height.

NEEDLE VALVE

If foreign matter is caught between the valve seat and the needle, the gasoline will continue flowing and cause it to overflow. If the seat and needle are worn out beyond the permissible limits, similar trouble will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber.

Remove the carburetor, float chamber and floats, and clean the float chamber and float parts with gasoline. If the needle is worn as shown below, replace it together with a valve seat. Clean the fuel passage of the mixing chamber with compressed air.

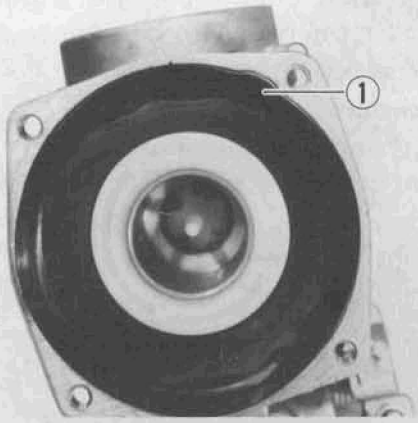


- Check following items for any damage or clogging.

* Pilot jet
* Main jet
* Main air jet
* Pilot air jet
* Needle jet air bleeding hole and O-ring
* Float
* Needle valve mesh
* Diaphragm
* Gasket
* Throttle valve shaft oil seals
* Drain plug O-ring
* Starter chamber gasket
* Pilot outlet and bypass holes

REASSEMBLY

- Place tongue ① of diaphragm to carburetor body properly.



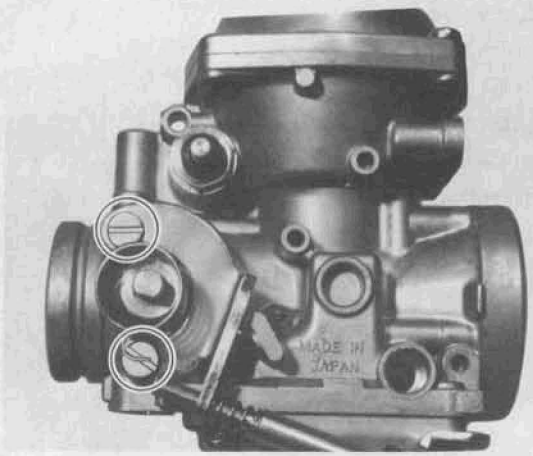
- Secure carburetor cap and float chamber with screws.

Tightening torque	0.25 - 0.45 kg·m (1.8 - 3.0 lb·ft)

- Secure adjuster bracket to No. 3 carburetor with two screws.
  Before tightening the screws, coat them with THREAD LOCK CEMENT.

Thread lock cement	99000-32040

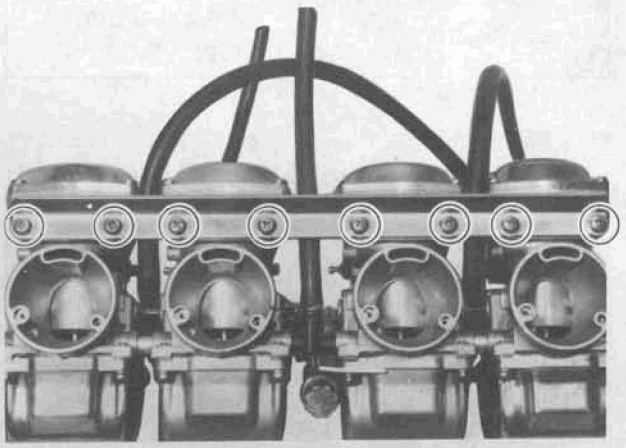
Tightening torque	0.25 - 0.45 kg·m (1.8 - 3.0 lb·ft)



- Secure adjuster lever with nut.

- Connect the carburetors correctly, and secure top of each carburetor to the plate with screws.

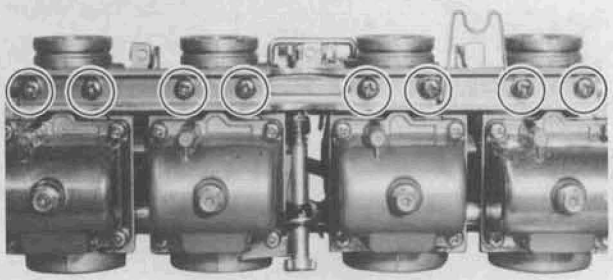
Tightening torque	0.25 - 0.45 kg·m (1.8 - 3.0 lb·ft)



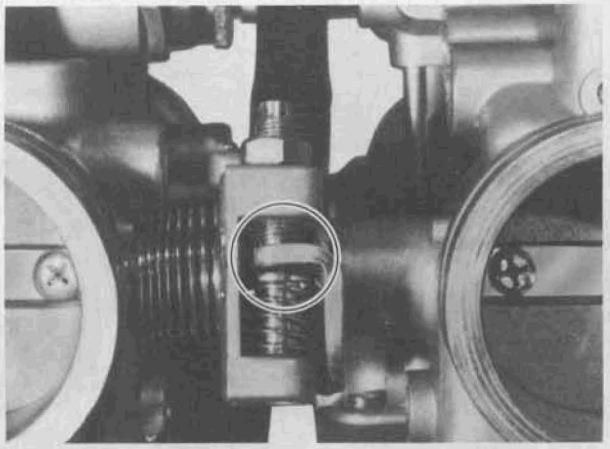
- Secure bottom of each carburetors to the plate with screws. Before tightening the screws, coat it with THREAD LOCK CEMENT.

Thread lock cement	99000-32040

Tightening torque	0.4 - 0.6 kg·m (3.0 - 4.5 lb·ft)

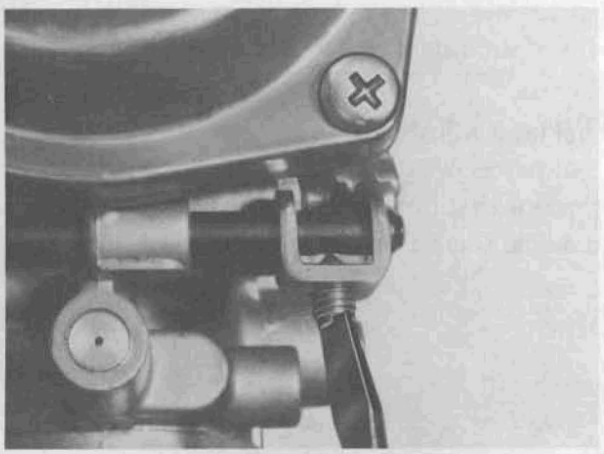


CAUTION:
Make sure the throttle shaft lever is installed as shown in photo.



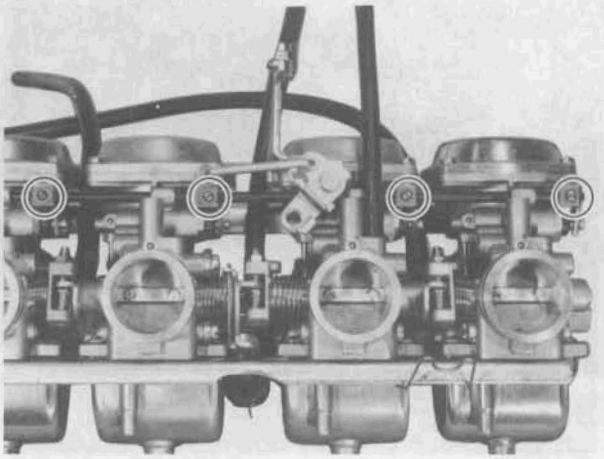
- Pass starter shaft through carburetors and starter levers, and secure starter lever with screws.
  Before tightening the screws, coat it with THREAD LOCK CEMENT.

CAUTION:
Align the end of screw with recess in starter shaft.



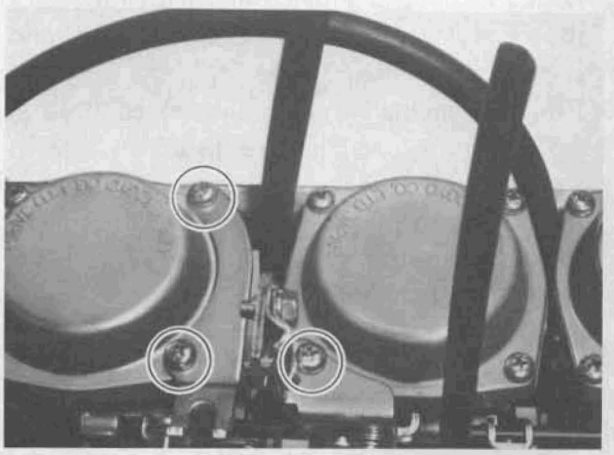
Thread lock cement	99000-32040

Tightening torque	0.06 - 0.10 kg·m (0.4 - 0.7 lb·ft)



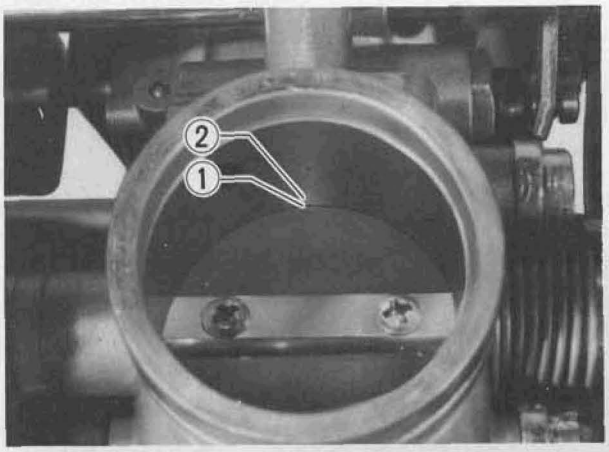
- Secure throttle bracket to No. 3 carburetor, and secure starter bracket to No. 2 carburetor cap, using screws.

Tightening torque	0.25 - 0.45 kg·m (1.8 - 3.0 lb·ft)



BALANCING FOUR CARBURETORS

Set each throttle valve in such a way that its top end ① meets the foremost bypass ②. This is accomplished by turning throttle valve stop screw and balance screw.



FUEL LEVEL MEASUREMENT

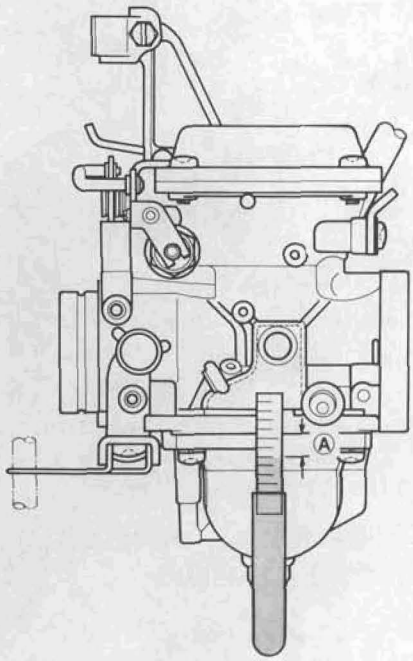
To check the fuel level, proceed as follows:

Checking fuel level in each float chamber

1. Leave fuel cock lever in "ON" or "RES" position.
2. Place machine on center stand.
3. Remove float chamber screw and install the special tool.
4. Move fuel cock lever to "PRI" position to admit fuel into float chamber.
5. With the float chamber filled with fuel, turn the cock lever back to "ON" position, and start up the engine.
6. Run the engine at the idling speed (950 – 1 150 r/min), and measure distance Ⓐ with the middle line of the level gauge aligned with the mating surface of the float bowl as shown in the illustration Ⓐ should be within the range specified here.

Fuel level gauge	09913-14511

Distance Ⓐ :	4.5 - 5.5 mm (0.18 - 0.22 in)



NOTE:
When checking the fuel level, place the machine on the center stand. The fuel level should be center of the float chamber.

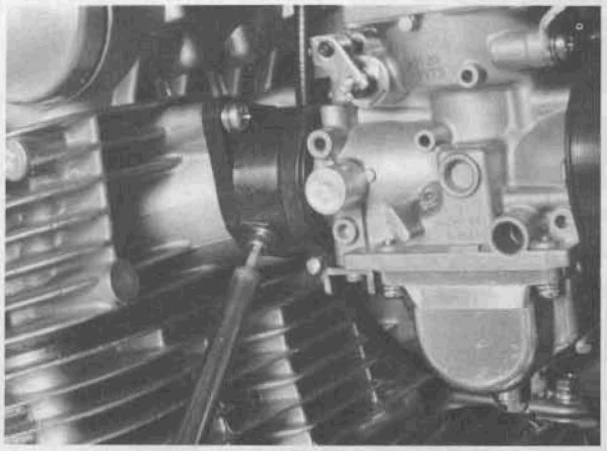
Fuel level adjustment

If distance Ⓐ is not within the specified range, it means that float height is off the specification, to adjust this height, as shown page 14-35.

BALANCING THE CARBURETORS

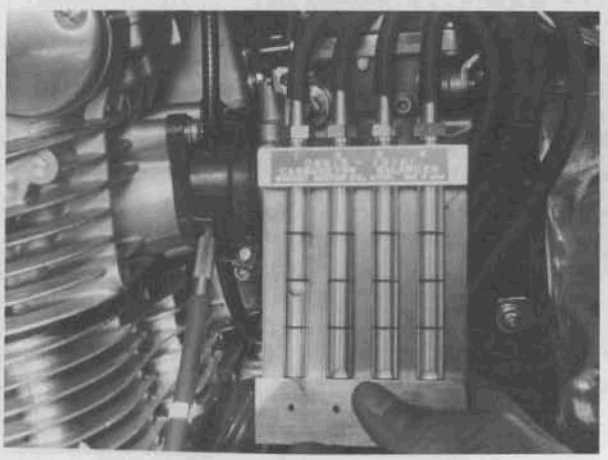
When any carburetor has been disassembled or replaced, check that the negative pressures (vacuum) in four carburetors are well balanced, using the carburetor balancer set in the following manner:

1. Place machine on center stand.
2. After warming up the engine completely, remove either No. 1 or No. 4 vacuum inlet screw, using a 4-mm hexagon wrench.

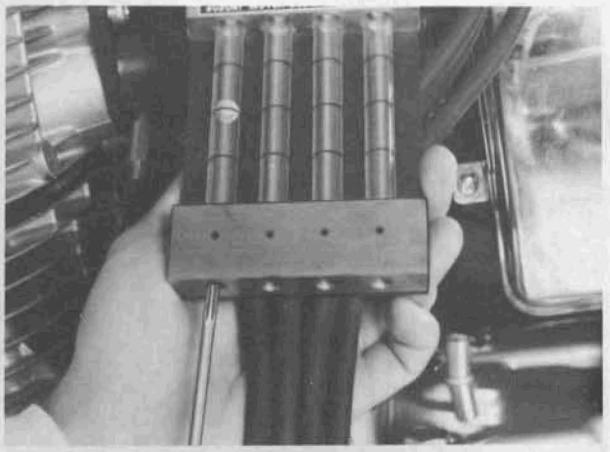


3. Insert one of the four carburetor balancer hoses into vacuum inlet.
4. Start up the engine, and keep it running at 1 500 - 2 000 r/min.

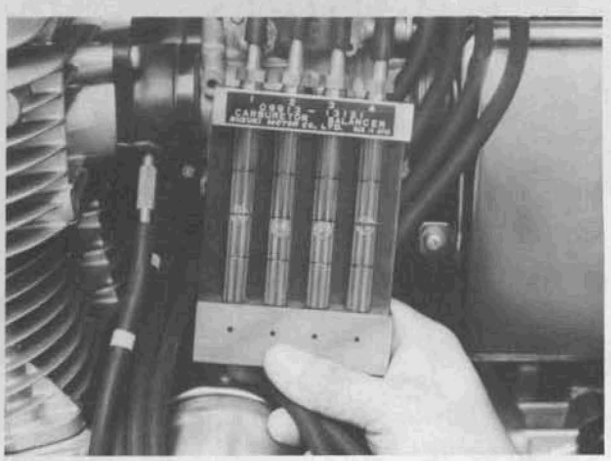
Carburetor balancer set	09913-13121



5. Turn the air screw of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball in the tube to the center.



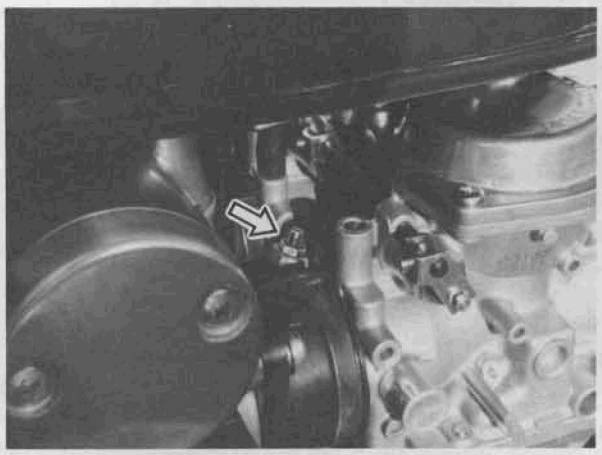
6. On the three other screws, follow the same procedure as above.
7. Remove the respective vacuum inlet screws and insert the adapters in the holes. Connect the balancer gauge hoses to these adapters, one hose to one adapter, and balancer the four carburetors as follows:
8. When the balls in No. 1 and No. 4 carburetor balancers are on the same level and the other balls are on the lower position as shown below, all the four carburetors are well balanced.



If the balls in No. 1 and No. 4 or in No. 2 and No. 3 carburetor balancers are off more than the radius of the ball, make an adjustment as follows:

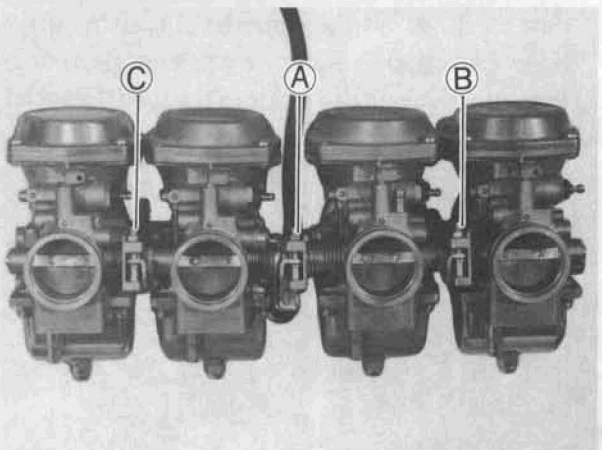
1. Loosen throttle valve balancing screw lock nut, and by turning balancing screw with special tool, adjust the position of steel ball in balancer gauge.

09913-14910	Throttle valve adjust wrench



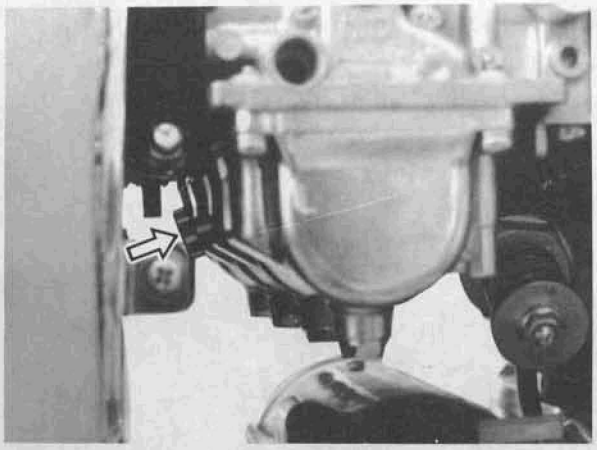
Adjusting order

Ⓐ(for No. 2 carb)→Ⓑ(for No. 1)→Ⓒ(for No. 4)



2. After adjusting, tighten throttle valve balancing screw lock nut.

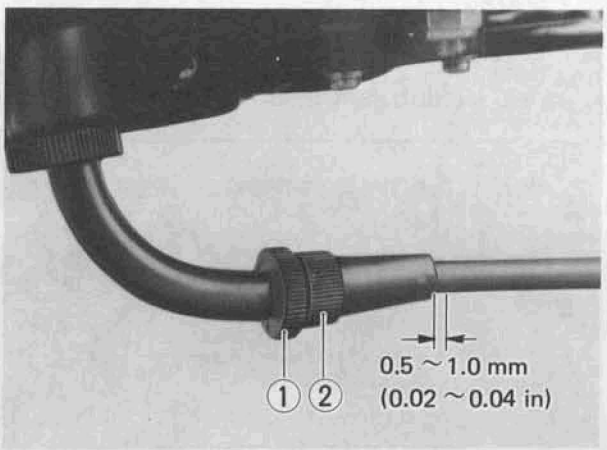
3. After this adjustment, adjust the idling speed to somewhere between 950 and 1 150 r/min with throttle stop adjusting screw.



CAUTION:
This check should be done as quick as possible. If adjustment requires a longer time, it is advisable to cool the engine by sending air to prevent engine overheating.

THROTTLE CABLE ADJUSTMENT

1. Loosen lock nut ①.
2. Adjust the cable slack by turning adjuster ② in or out to obtain the correct slack 0.5 - mm (0.02 - 0.04 in).



3. After adjusting the slack, tighten the lock nut.

EMISSION CONTROL & REGULATIONS

EMISSION REGULATIONS

On February 4, 1977, Federal Emission Regulations for motorcycles that may be licensable took effect. The regulations provided for a gradual, multi-step application of stricter emission limits beginning with all effected motorcycles manufactured after January 1, 1978, culminating with the present 1980 emission level restrictions. For the 1980 and succeeding years one set of emission limits will be in effect. They are as follows:

1980 EMISSION LIMITS

CATEGORIES	HYDROCARBONDS (HC)	CARBON MONOXIDE
All motorcycles 50 cc – Larger	5.0 Grams/Kilometer (8.0 Grams/Mile)	12 Grams/Kilometer (19.3 Grams/Mile)

Emission-controlled motorcycles which are subject to the emission regulations are those motorcycles which are equipped with a headlight, taillight, stop light and which have an engine displacement larger than 50 cc.

Suzuki Motor Company performed all the necessary testing and certification of emission-controlled models in strict compliance with the E.P.A. testing regulations. Suzuki motorcycle dealers are not required to either test or certify emission levels on any motorcycles as Suzuki Motor Company is legally responsible for the entire certification procedure.

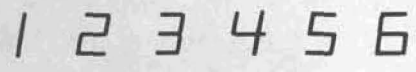
E.P.A. regulations also provide fines for individuals who alter, render inoperative or improperly service emission-controlled motorcycles ranging up to $10,000.00 per motorcycle. It is essential that the individual servicing this emission-controlled motorcycle review thoroughly all the service procedures presented in this manual. Under no circumstances should the recommended service procedures be deviated from nor adjustments made which are not in accordance with the factory specifications or service procedures.

EMISSION CONTROL CARBURETOR COMPONENTS

GS850G motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

There are several carburetor mixture control components in each carburetor assembly. Three (3) of these components are machined to much closer tolerances than standard machined carburetor jets. These three (3) particular jets – MAIN JET, NEEDLE JET, PILOT JET – must not be replaced by standard jets. To aid in identifying these three (3) jets a different design of letter and number are used. If replacement of these close tolerance jets becomes necessary, be sure to replace them with the same type close tolerance jets marked as in the examples shown below.

The jet needle is also of special manufacture. Only one clip position is provided on the jet needle. If replacement becomes necessary the jet needle may only be replaced with an equivalent performing replacement component. Suzuki recommends that Genuine Suzuki Parts be utilized whenever possible for the best possible performance and durability.

Conventional Figures Used on Standard Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0
Emission Type Figures Used On Close Tolerance Jet Components	

The carburetor specification for the emission-controlled GS850G are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
45110	#115	X-5	5D50	#40	PRE-SET DO NOT ADJUST

The pilot screw is pre-set by the factory utilizing specialized testing and adjusting procedures. The pilot screw is not adjustable as the idle circuit is "sealed" after factory adjustment. Adjusting, interferring with, improper replacement, or resetting of any of the carburetor components may adversely affect carburetor performance and cause the motorcycle to exceed the exhaust emission level limits. If persons, who are unaware of these special carburetor servicing requirements tamper with the carburetors the Suzuki dealer should restore the carburetors to their original condition or if unable to effect repairs, contact the distributors representative for further technical information and assistance.

GENERAL EMISSION INFORMATION

There are three different types of regulated exhaust emissions. They are:

Hydrocarbons (HC)
Carbon Monoxide (CO)
Oxides of Nitrogen (NOx)

Automobiles must meet specific emission standards for all three of these pollutants. Motorcycles must only meet the requirements for the following:

Hydrocarbons (HC)
Carbon Monoxide (CO)

HC exhaust emissions are basically unburned fuel vapors which have passed through the engine and escaped the combustion process.

CO exhaust emissions are formed during an incomplete combustion cycle as a result of a rich air/fuel mixture. The only way that CO can be produced is by the combustion cycle.

Total NOx emissions from all motorcycles is considered negligible. The EPA states that total NOx emission from motorcycles by 1990 will only amount to approximately 0.5%. NOx is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

Carbon monoxide is a product of an incomplete combustion cycle. CO is measured in grams per mile or kilometer and also in percentage (%)

The most common cause of CO is rich carburetion. As the mixture is richened excessively, the CO amount increases proportionately. Engine oil is also a hydrocarbon, so engine problems which lead to oil burning increase carbon monoxide.

CARBURETION MALFUNCTION

1. Air Cleaner – Dirty or over oiled.
2. Idle Mixture – Adjusted incorrectly.
3. Idle Speed – Too high or low.
4. Fuel Level – Sticking float, leaking needle, incorrect setting.
5. Choke – Leaking or linkage sticking.
6. Synchronization – Improper balance on multi cylinders.

ENGINE MALFUNCTIONS

1. Valve Seals – Leaking or torn.
2. Valve Guide – Worn and leaking excess oil.
3. Gaskets – Leaking oil into combustion chamber.

HYDROCARBONS

Hydrocarbons are unburnt gasoline vapors and can be measured in two different ways. The first is to measure the weight of the pollutants over a specific distance such as grams per mile or grams per kilometer. The second method is to measure the concentration of HC in the exhaust gas in parts per million (PPM).

The most common cause of high HC emissions are ignition system problems. If the ignition system fails to ignite the fuel mixture properly, then raw gasoline vapors will pass through the engine into the exhaust system. Listed are the most common ignition problems which occur and which can affect HC emission output.

IGNITION SYSTEM MALFUNCTIONS

1. Spark Plugs – Fouled, dirty, improper type or improperly gapped.
2. Ignition timing – Advanced or Retarded.
3. Timing Advance – Too fast or too slow an advance rate.
4. Battery – Low charge or faulty.

Carburetion can also lead to high HC emissions if the mixture is either excessively rich or excessively lean.

MIXTURE-RELATED MALFUNCTIONS

1. Air Cleaner – Dirty, over oiled or torn.
2. Jets – Clogged, restricted or incorrect size.
3. Float Level – Level too low (lean) or too high (rich).
4. Choke – Leaking choke plunger or sticking linkage.
5. Air Leaks – Intake manifolds, engine gaskets and other sealing surfaces.
6. Synchronization – Unbalanced on multi-cylinder machines.
7. Exhaust System – Restricted flow or improper exhaust system.

Engine wear or damage can also cause high HC emissions.

1. Rings – Low compression, leakage into crankcase.
2. Valves – Improper adjustment, bent stem or burnt.
3. Gaskets – Leaking, loss of compression.
4. Crank Seals – Leaking.
5. Oil Consumption – Worn valve guides, worn rings, clogged crankcase breather.
6. Oil – Improper engine oil.

FULL-TRANSISTORIZED IGNITION SYSTEM

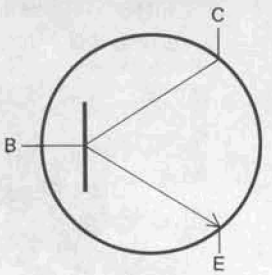
A fully transistorized ignition system is now employed on the GS850G. Its primary advantages are:

* Trouble free operation due to elimination of contact breaker points which can become contaminated.
* Ignition timing is maintained properly at all times and require no maintenance.
* Free from arcing and provides the ignition coil with stable secondary voltage.
* Excellent vibration and moisture resistance.

Transistor functions can be divided into four main functions:

1. amplification
2. switching
3. oscillation
4. modulation

These functions are utilized in the ignition system employed on the GS850G.
Transistors are divided into two groups, those being of the NPN and PNP types, and the transistors used in the GS850G model is of the NPN type only, works an amplifier and switching device.



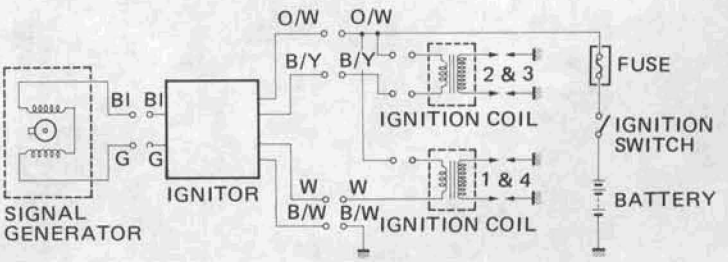
B : BASE
C : COLLECTOR
E : EMITTER

Each transistor has three terminals identified as the Base (B), Collector (C), and Emitter (E), and operation is as follows:

On a NPN type the base is the controling terminal of the transistor operation. On this type, the base utilizes only a positive or incoming signal to do the "ON", or "OFF" switching. The collector is the terminal where voltage is supplied to the transistor and the emitter is the terminal for passing this current for usage when the base has the proper "signal". Usually the voltage applied across the collector to the emitter is much larger than that needed at the base. This allows a relatively low voltage at the base to control large working voltages across the collector to the emitter.
The transistor ignition system used on the GS850G is (the Nippon Denso brand and) consists of a signal generator, which employs a rotor and two pick-up coils, the transistor unit, ignition coils, and spark plugs.

SIGNAL GENERATOR:

The signal generator is mounted on the right hand side of the engine in the area commonly used for the contact breaker points. It is comprised of an iron rotor attached to a mechanical advance mechanism and two pick-up coils, with magnets at their bases, affixed to a plate. Each pick-up coil consists of a coil or wire and a yoke or coil and is mounted 180° apart on the plate. As the rotor tip is turned past the coils, AC current is produced and used for switching within the transistor unit.
The transistor unit controls power to the ignition coils and causes the spark plugs to fire at the proper time.



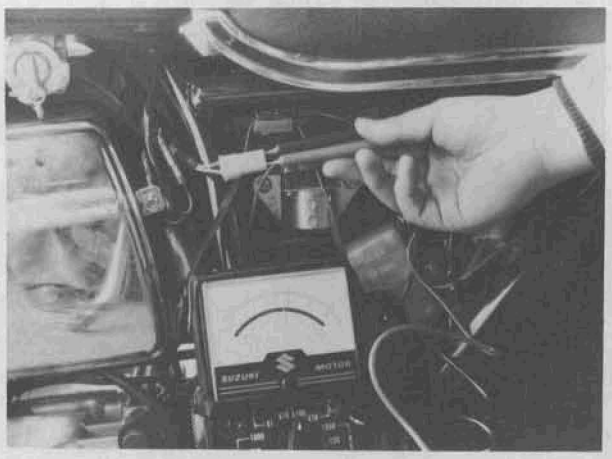
INSPECTION

SIGNAL GENERATOR

Measure the resistance between lead wires.
If the resistance noted to show infinity or too low a resistance value must be replaced.

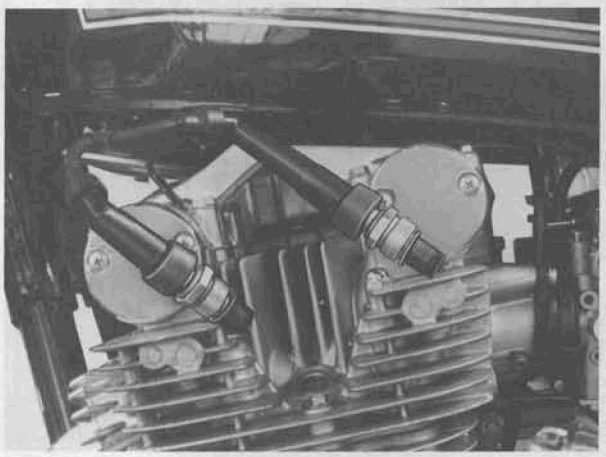
09900-25002	Pocket tester

STD resistance	
BL – G	250 – 360Ω



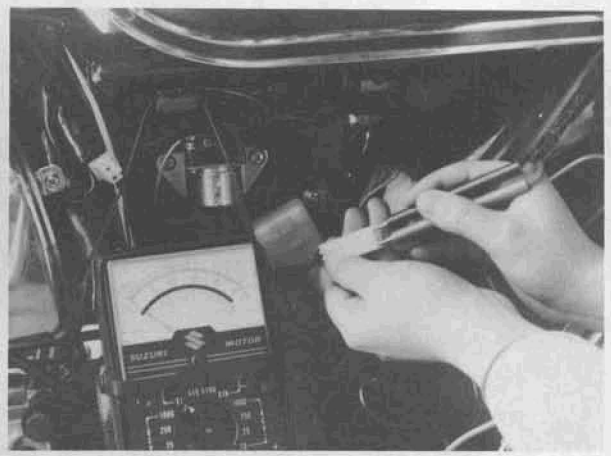
IGNITOR

Remove each spark plug of Nos. 1 and 2 cylinders, fit it to respective plug cap and place it on the cylinder head.

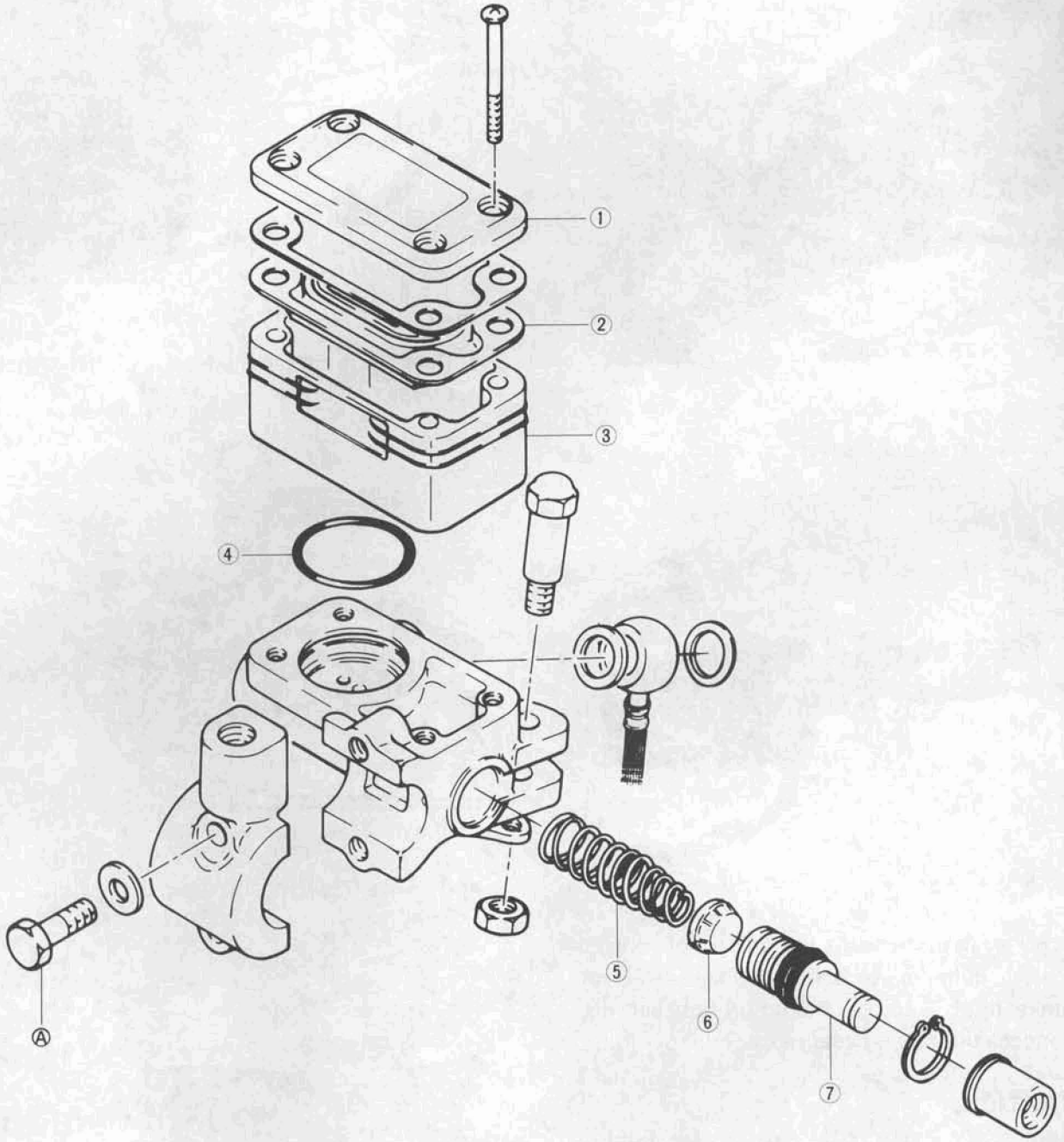


Remove the frame cover on the left side and disconnect the lead wire from the signal generator.
Turning the ignition switch to the ON positior
Now connect ⊕ pin of SUZUKI Pocket Teste (X1Ω range) with Blue lead wire on the ignitc side and ⊖ pin with Green lead wire. The ignitc is in good condition if the following is observed The moment the test pins are connected th spark plug of No. 1 cylinder sparks and th moment the tester pins are disconnected th spark plug of No. 2 cylinder sparks.

NOTE:
This checking presupposes that the ignition coil used for checking is a good one.



FRONT MASTER CYLINDER

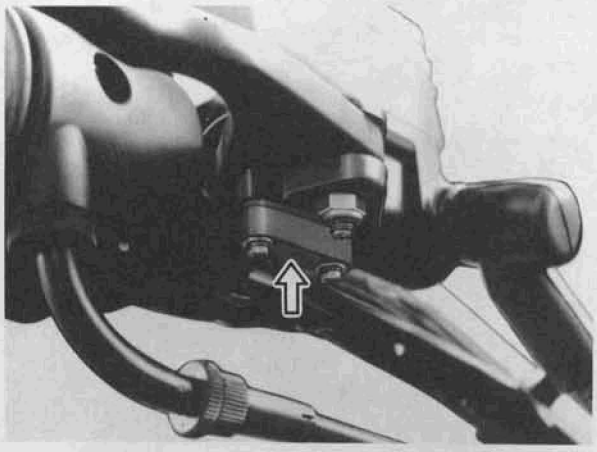


① Reservoir cap
② Diaphragm
③ Reservoir
④ O ring
⑤ Spring
⑥ Primary cup
⑦ Piston

	Tightening torque	
	kg·m	lb·ft
Ⓐ	0.5 – 0.8	3.5 – 6.0

MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Take off front brake light switch.

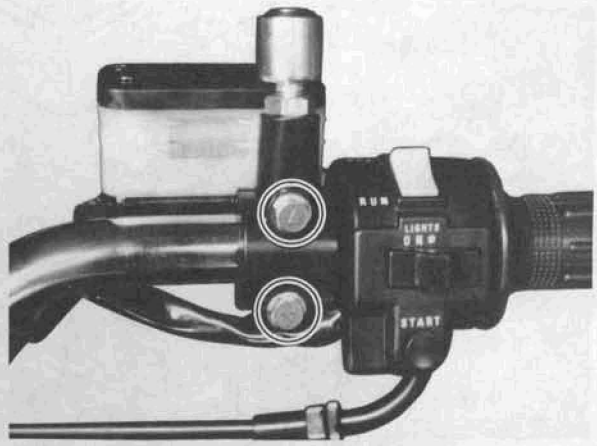


- Remove front brake lever.

- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

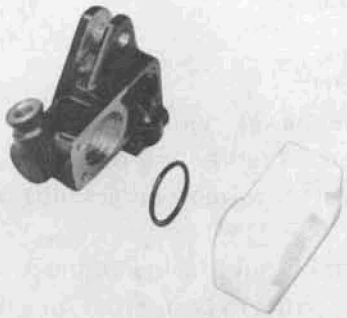
CAUTION:
Completely wipe off any brake fluid adhering to any part of motorcycle. The fluid reacts chemically with paints, plastics, rubber materials, etc.

- Remove master cylinder ass'y after removing two fitting bolts.

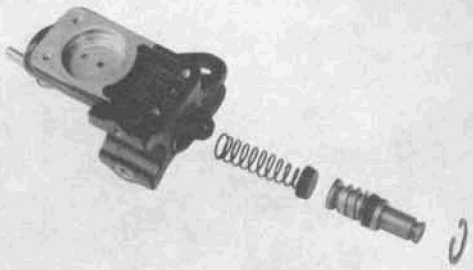


- Remove filler cap and drain brake fluid.

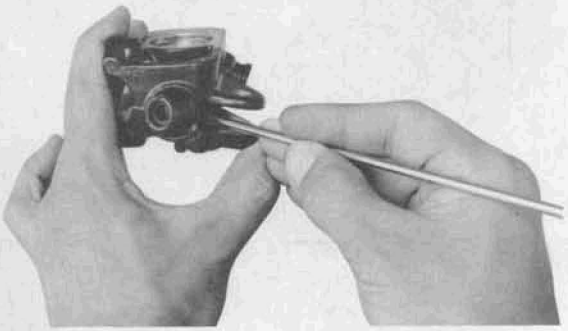
- Pull out the reservoier and O ring.



- Pull out piston, primary cup and spring.



- Draw out dust seal boot.

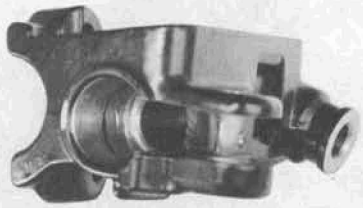


- Remove circlip by using special tool.

09900-06108	Snap ring pliers

MASTER CYLINDER INSPECTION

- Inspect the cylinder bore wall for any scratch or other damage.



- Inspect the piston surface for scratch or other damage.

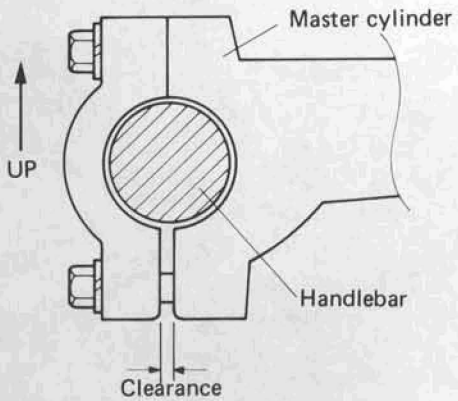
- Inspect the primary cup, secondary cup and dust seal boot for damage.

MASTER CYLINDER REASSEMBLY

- Reassemble the master cylinder in the reverse orders of disassembly and by taking the following steps:

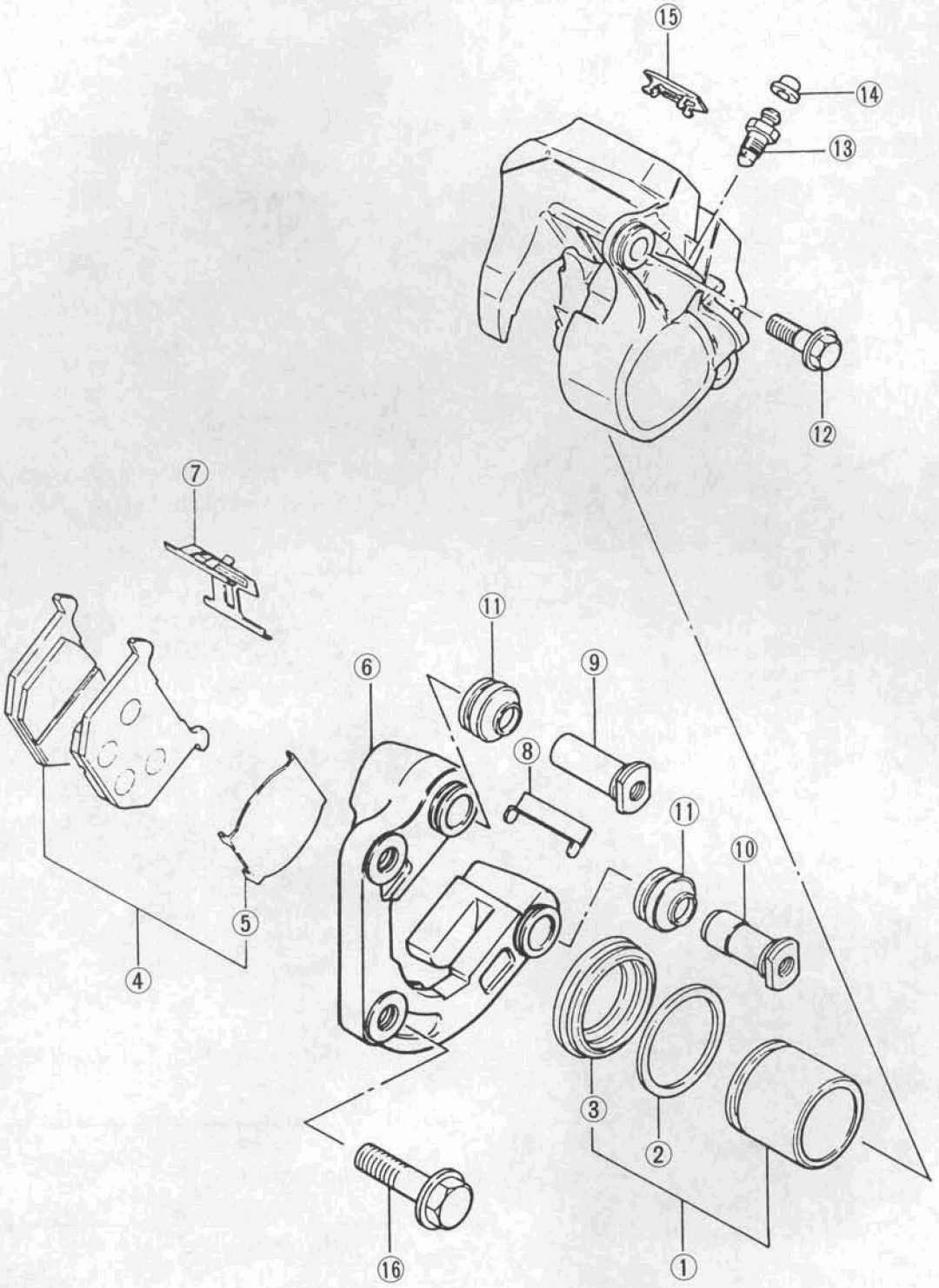
CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

- When remount the master cylinder to the handlebars, first tighten the clamp bolt for upside as shown.



CAUTION:
Adjust the front brake light switch after installation.
Bleed the air after reassembling master cylinder. (See page 11-30)

FRONT CALIPER



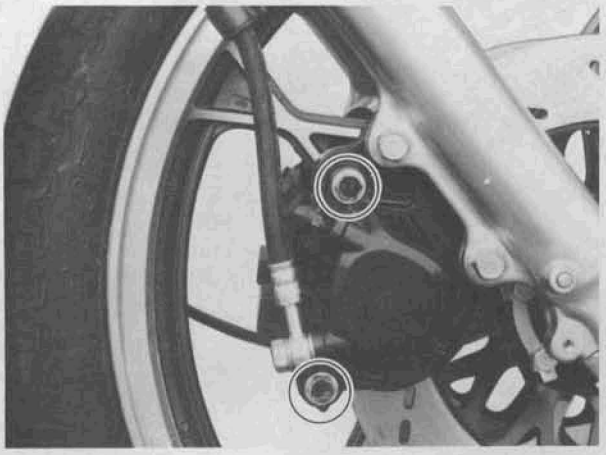
① Piston set
② Piston seal
③ Piston boot
④ Pad set
⑤ Pad shim
⑥ Caliper holder
⑦ Pad spring
⑧ Pad guide
⑨ Caliper axle No. 1
⑩ Caliper axle No. 2
⑪ Axle boot
⑫ Bolt
⑬ Bleeder
⑭ Cap
⑮ Cover
⑯ Bolt

	Tightening torque	
	kg·m	lb·ft
⑫	1.5 – 2.0	11.0 – 14.5
⑯	2.5 – 4.0	18.0 – 29.0

BRAKE PAD REPLACEMENT

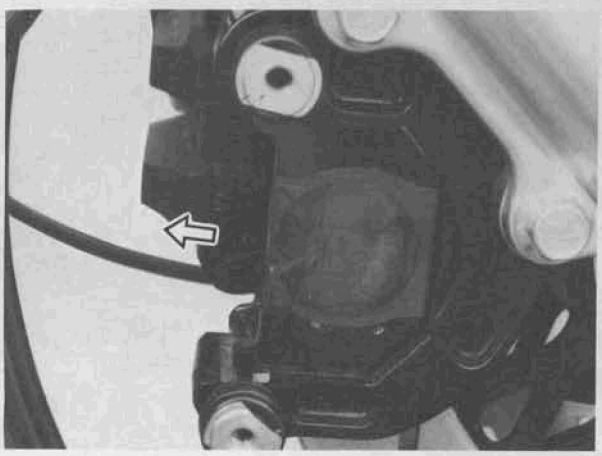
- Remove two bolts and take off caliper.

CAUTION:
Do not operate the brake lever while removing the caliper.

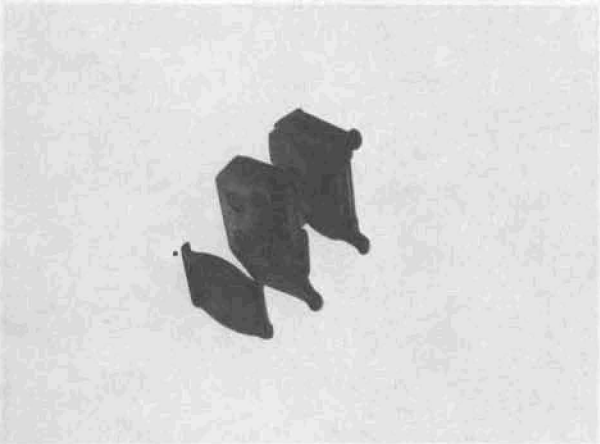


- Pull out brake pads with pad shim.

CAUTION:
Replace the brake pad with a set, otherwise braking performance will be adversely affected.



CAUTION:
Do not apply pad grease, when installing the brake pads.



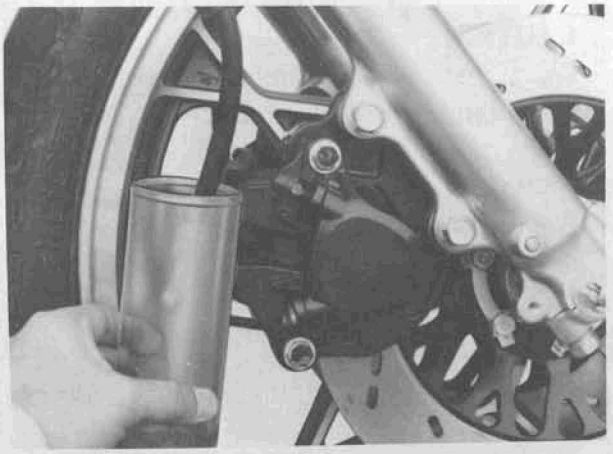
NOTE:
Push in the piston all the way to the caliper when remount the caliper.

- Tighten the caliper axle bolts with specified torque.

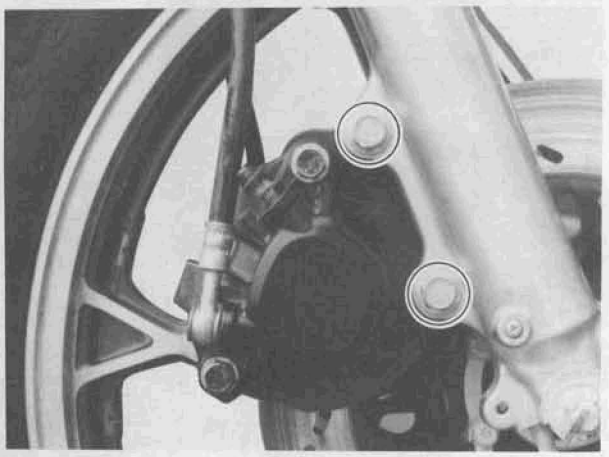
Tightening torque	1.5 - 2.0 kg·m (11.0 - 14.5 lb·ft)

CALIPER REMOVAL AND DISASSEMBLY

- Disconnect brake hose and catch the brake fluid in a suitable receptacle.



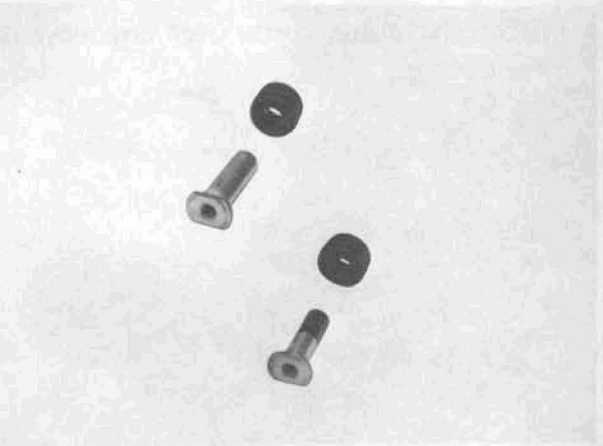
- Remove caliper axle bolts and take off caliper.



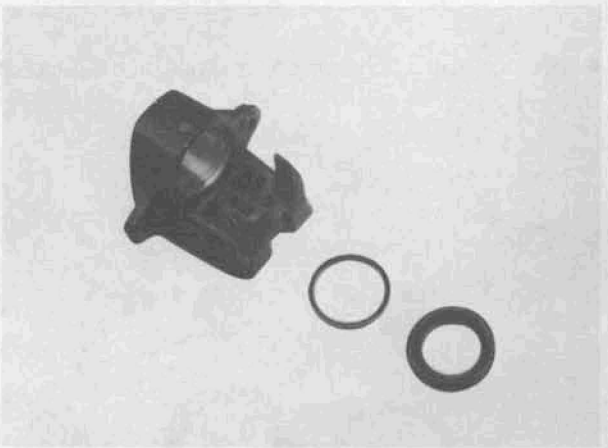
- Place a rag over the piston to prevent popping up. Draw out the piston by using air gun.

CAUTION:
Do not use high pressure air for preventing piston damage.

- Remove caliper bracket and draw out caliper axles.



- Remove piston boot and piston seal.

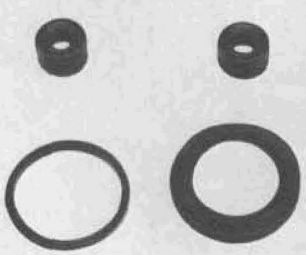


CALIPER AND DISC INSPECTION

- Inspect the cylinder bore wall for nick, scratch or other damage.

- Inspect the piston surface for any flow or other damage.

- Inspect the each rubber parts for damage or wear.



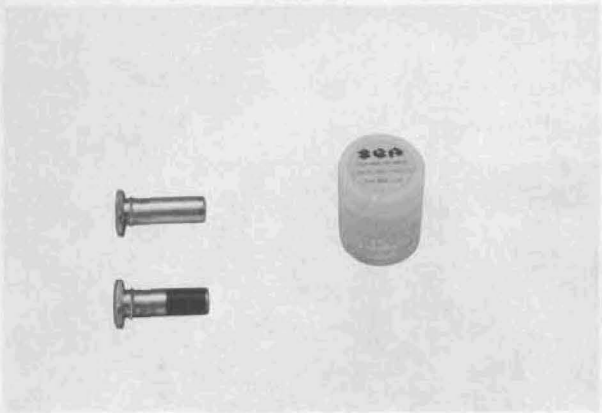
CALIPER REASSEMBLY

- Reassemble the caliper in the reverse orders of disassembly and by taking the following steps:

CAUTION:
Wash the caliper components with fresh brake fluid before reassembly.
Never use cleaning solvent or gasoline to wash them.
Apply brake fluid to the caliper bore and piston to be inserted into the bore.

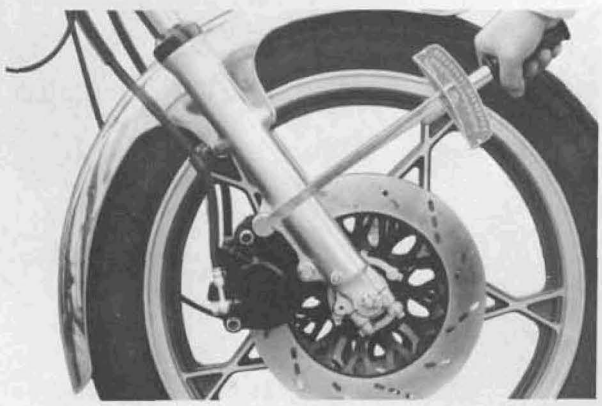
- Apply grease to the caliper axles.

99000-25100	SUZUKI SILICONE GREASE



- Tighten the caliper axle nuts and caliper mounting bolts with specified torque.

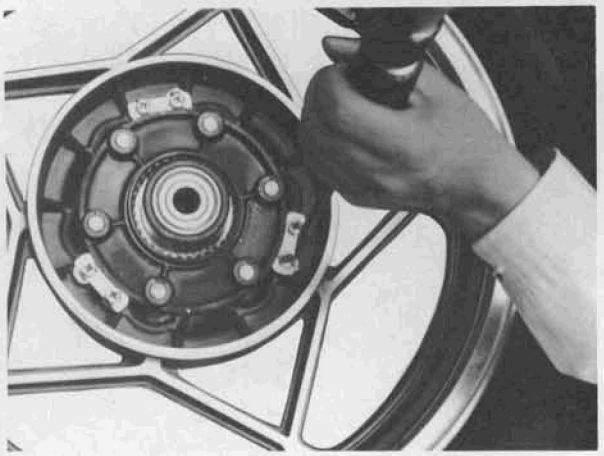
	Tightening torque
Caliper axle bolt	1.5 - 2.0 kg·m (11.0 - 14.5 lb·ft)
Caliper bolt	2.5 - 4.0 kg·m (18.0 - 29.0 lb·ft)



REAR WHEEL

REAR WHEEL REMOVAL AND DISASSEMBLY

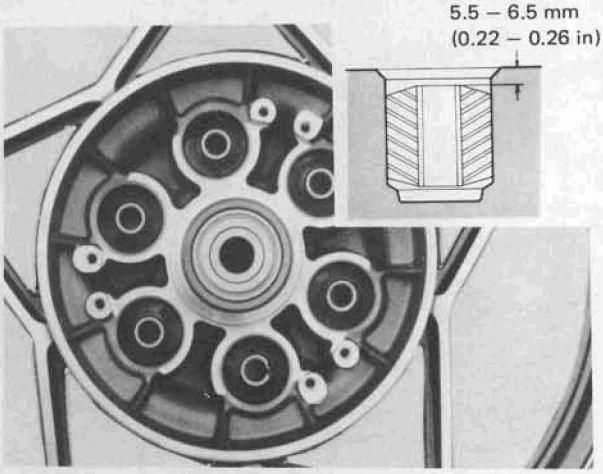
- The rear wheel can be removed from the machine in the same manner as in the GS850GN model. Therefore, we discuss the subsequent operations. (See page 11-42)
- Bend up the lock washer, remove the bolts and separate the driven joint from the wheel.



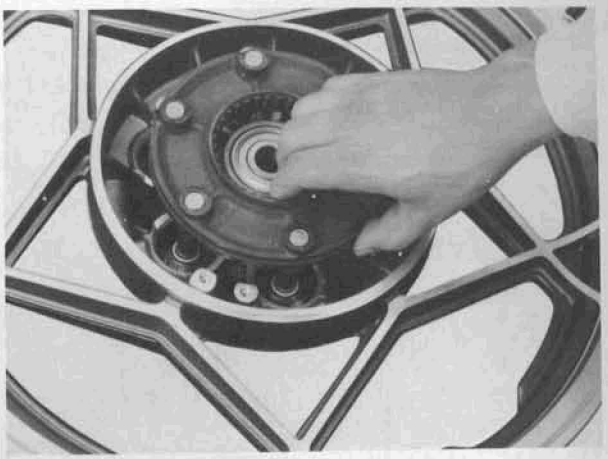
- Remove the bushings from the wheel.

REAR WHEEL REASSEMBLY

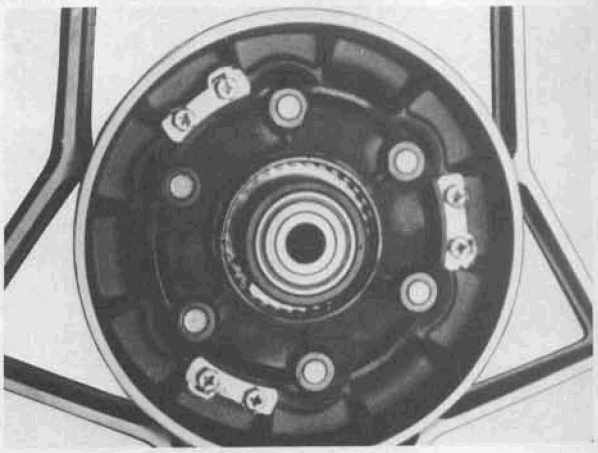
- Drive bushings into the wheel.



- Insert driven joint into wheel bushing.

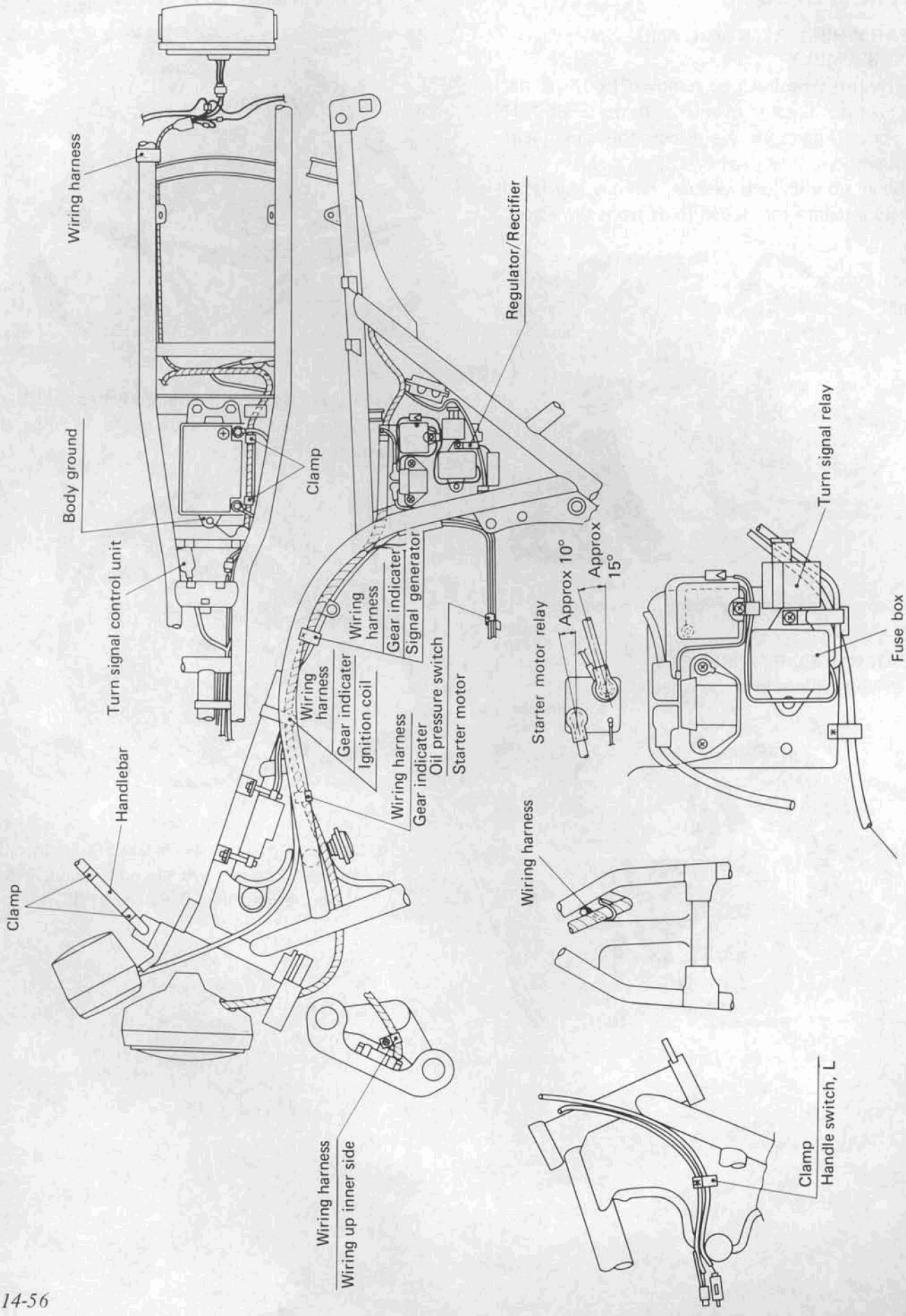


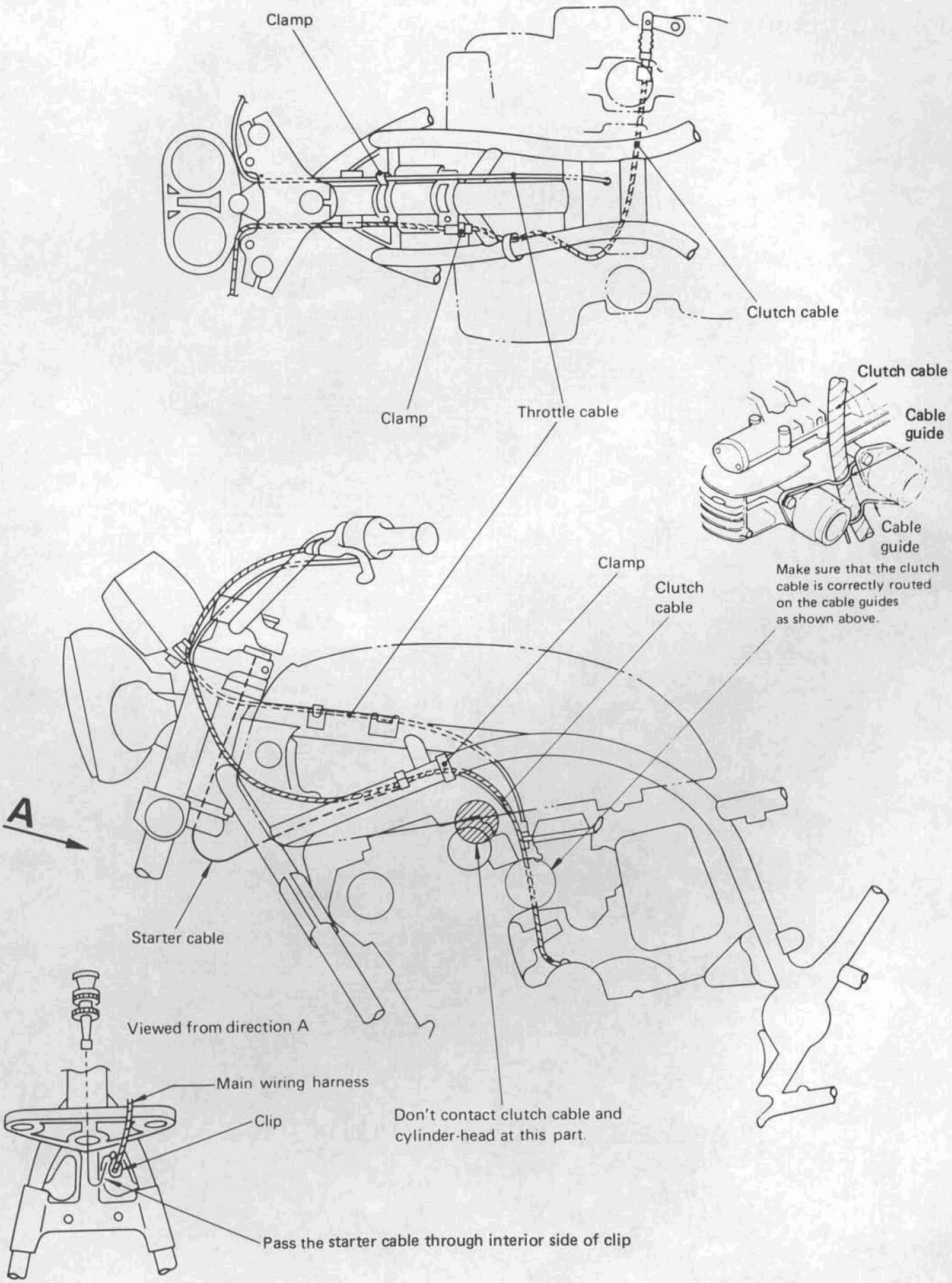
- Place three washers in the groove around the driven joint and tighten six bolts. Then bend washers to lock the bolts.



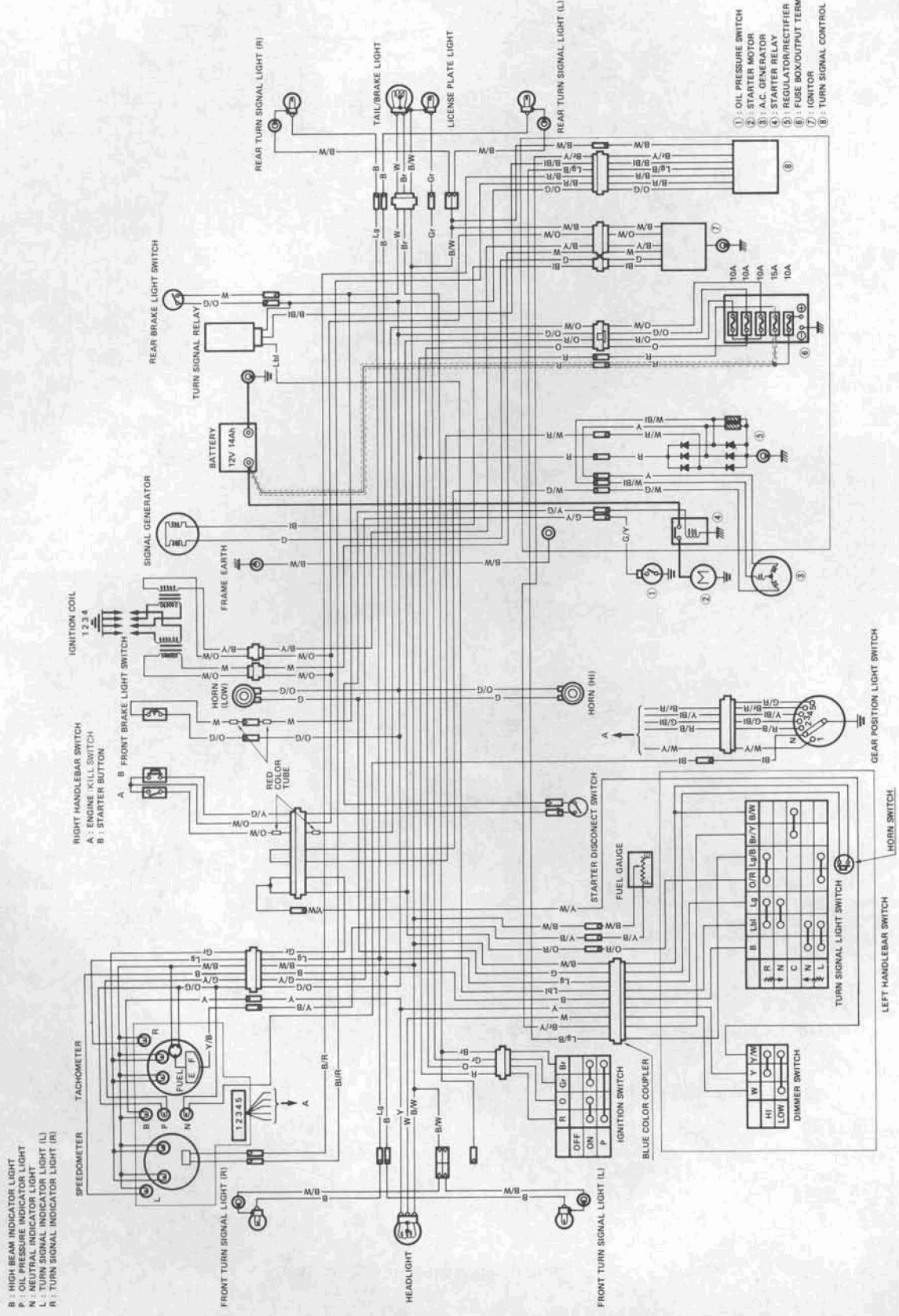
- In the same manner as in GS850GN, install disc plate on the wheel, and install rear wheel on the machine. (See page 11-45)

WIRE AND CABLE ROUTING




Clamp
Clutch cable
Clamp
Throttle cable
Clutch cable
Cable guide
Cable guide
Make sure that the clutch cable is correctly routed on the cable guides as shown above.
Clamp
Clutch cable
A
Starter cable
Viewed from direction A
Main wiring harness
Clip
Don't contact clutch cable and cylinder-head at this part.
Pass the starter cable through interior side of clip

WIRING DIAGRAM



GS850GLT

This section gives service data and items which differ from those of the GS850GN/GT and describes the new features of GS850GLT. Refer to the sections 1 through 14 except for the items described in this section.

CONTENTS

VIEWS OF GS850GLT 15- 2

SPECIFICATIONS 15- 3

SERVICE DATA 15- 5

FUEL COCK 15- 7

WIRE AND CABLE ROUTING 15- 8

WIRING DIAGRAM 15-10

VIEW OF GS850GLT

Right side

Left side

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 280 mm (90.0 in)
Overall width	900 mm (35.4 in)
Overall height	1 230 mm (48.4 in)
Wheelbase	1 510 mm (59.4 in)
Ground clearance	150 mm (5.9 in)
Dry mass	245 kg (540 lbs)
Gross vehicle weight rating	455 kg (1 003 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm^3 (51.4 cu. in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS32SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 40′
Trail	105 mm (4.13 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50H19 4PR
Rear tire size	4.50H17 4PR
Front tire pressure	1.75 kg/cm^2 (25 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm^2 (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank		13 L (3.4 US gal)
Engine oil	change	2.8 L (3.0 US qt)
	filter change	3.6 L (3.8 US qt)
	overhaul	3.8 L (4.0 US qt)
Secondary bevel gear oil		340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil		280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure		0.6 kg-m (8.5 psi)
Front fork oil		302 ml (10.20 US oz) in each leg

* Specifications subject to change without notice.

SERVICE DATA

Please refer to the service data of GS850GT except for the service data shown below.

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	160 (6.3)	—
Front fork spring free length	—	426 (16.8)
Front fork oil level	160 (6.3)	—
Front fork air pressure	0.6 kg/cm^2 (8.5 psi)	—
Rear wheel travel	100 (3.9)	—

FUEL + OIL CAPACITY

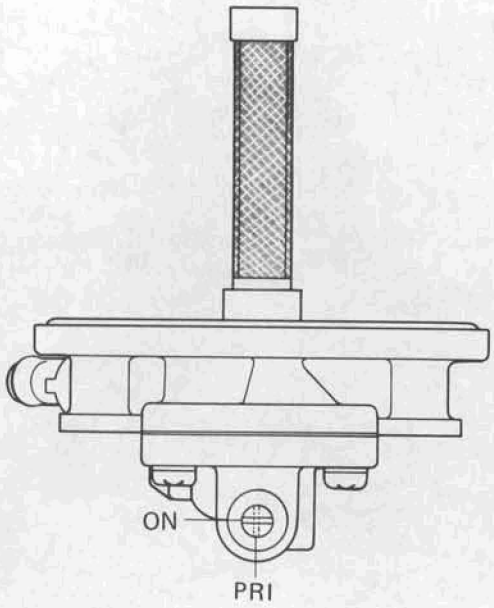
Unit: mm (in)

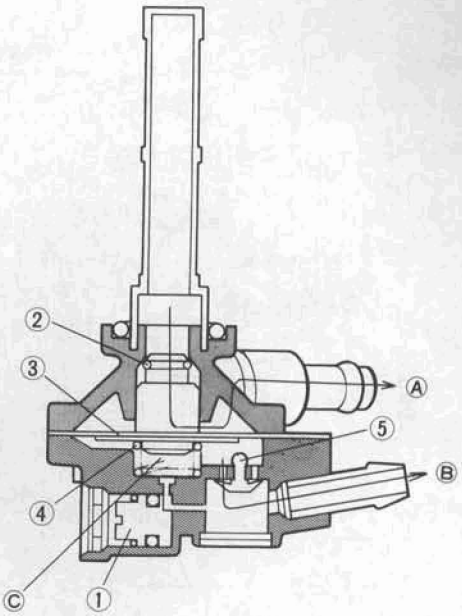
ITEM		SPECIFICATION
Fuel type		Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.
Fuel tank		13 L (3.4 US gal)
Engine oil type		SAE 10W/40
Front fork oil type		SAE 10W/20
Front fork oil capacity (each leg)		302 ml (10.20 US oz)
Bevel gear oil type		Hypoid Gear Oil SAE 90, API Grade GL-5
Bevel gear oil capacity	Secondary	340 – 400 ml (11.5–13.5 US oz)
	Final	280 – 330 ml (9.5–11.2 US oz)
Brake fluid type		DOT3 or DOT4

Unit: W

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32 cp)
Turn signal light		23 (32 cp)
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
Fuel gauge indicator light		3.4

FUEL COCK



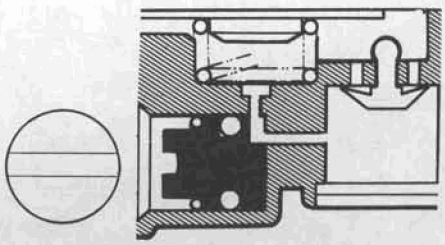


① Fuel valve ② O-ring ③ Diaphragm
④ Spring ⑤ One way valve
Ⓐ Fuel flow Ⓑ Vacuum

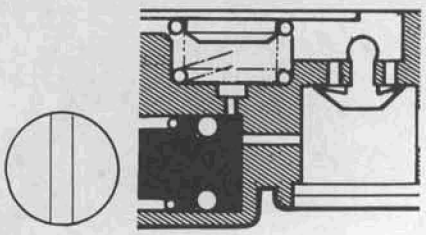
When the engine is not running with the valve in the ON position, the fuel valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is engaged, a negative pressure is generated in the diaphragm chamber Ⓒ through the vacuum (negative pressure) pipe which is connected to the carburetors, and builds up a negative pressure which is higher than the spring pressure so that the diaphragm is forced to open the fuel valve and thus allow the fuel to flow to the carburetors.

On the other hand, setting the valve in the ON position keeps the air return orifice open. Negative pressure does not accumulate on the diaphragm at the time of engine stopping, and then the spring pressure actuates the diaphragm to move back to its original position and closes the fuel valve.

However, setting the valve in PRI position with a screwdriver causes the air return orifice to close, resulting in negative pressure in the chamber Ⓒ under the diaphragm. This negative pressure doesn't allow the fuel valve to close and therefore the fuel keeps flowing to the carburetors.



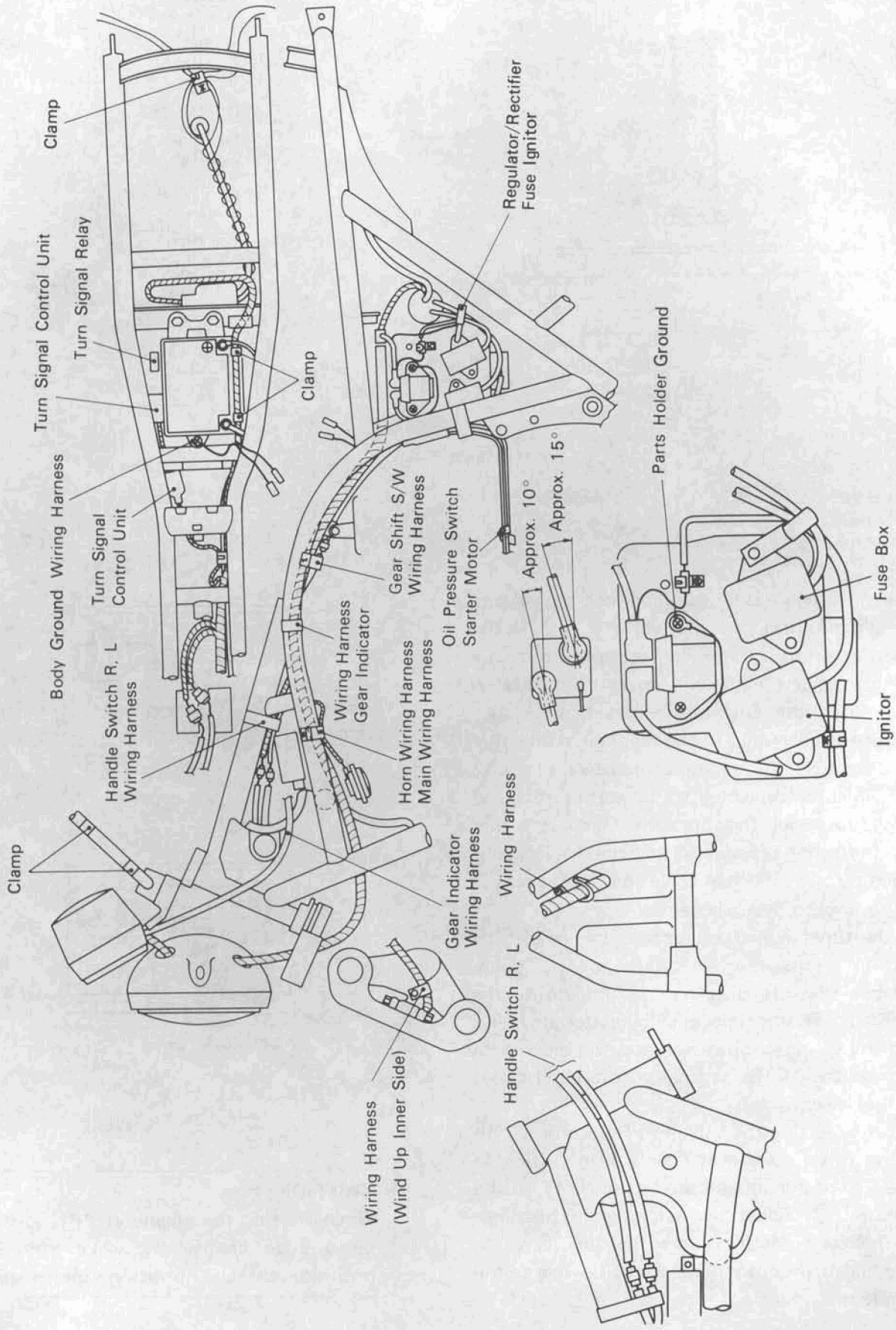
ON

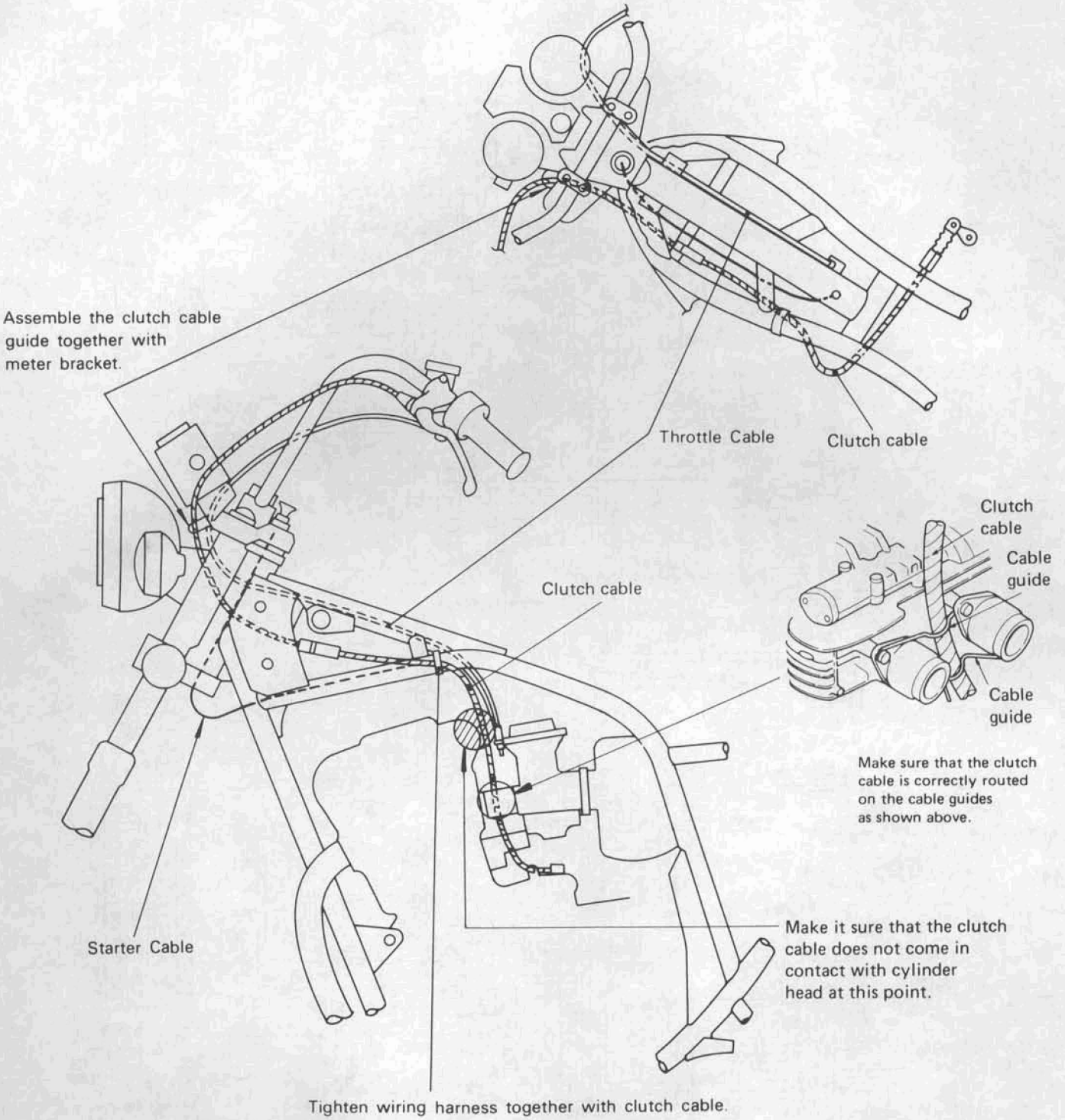


PRI

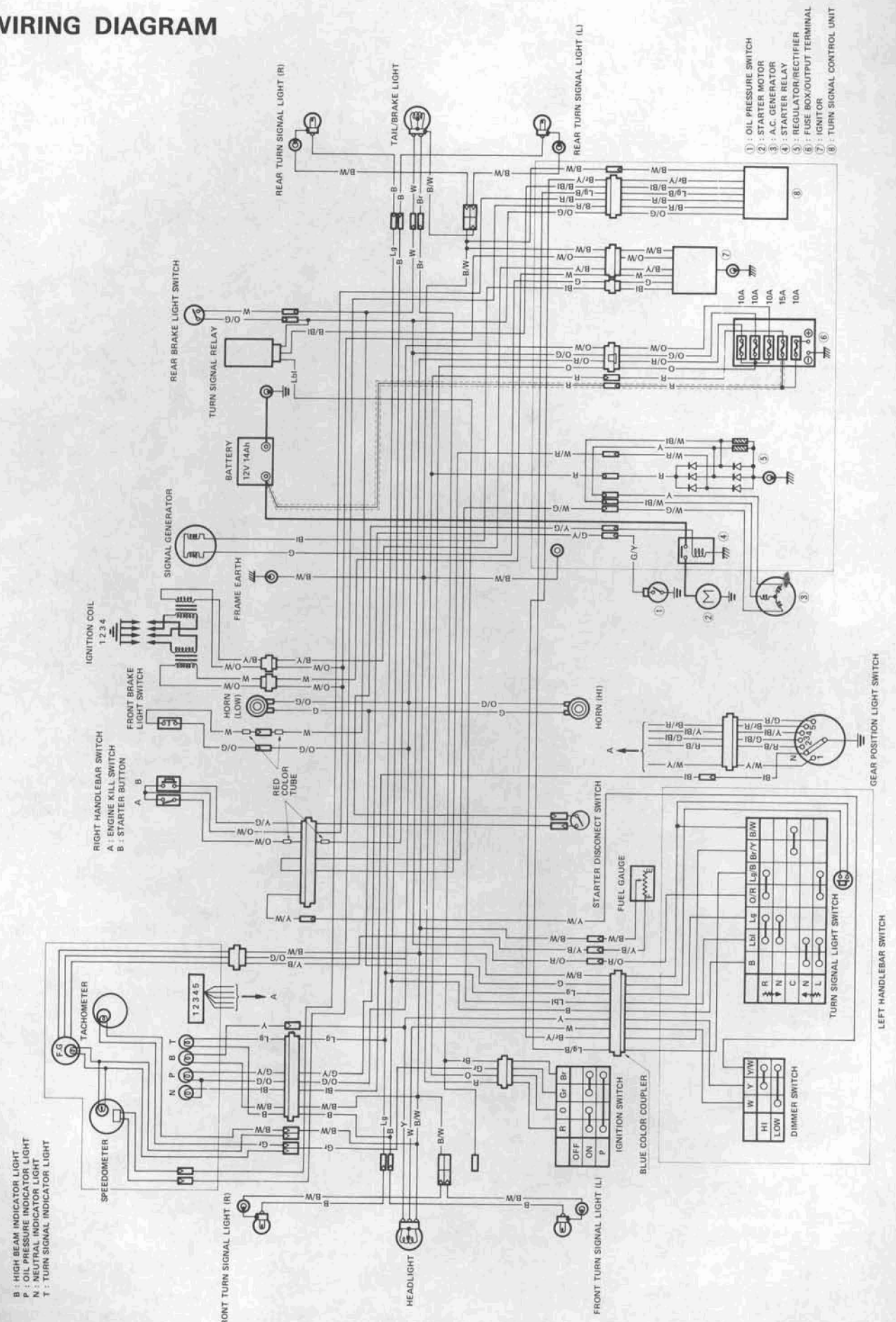
CAUTION:
When starting the engine at PRI position, be sure to change the valve from PRI position to ON position immediately.

WIRE AND CABLE ROUTING




Assemble the clutch cable guide together with meter bracket.
Throttle Cable
Clutch cable
Clutch cable
Clutch cable
Cable guide
Cable guide
Make sure that the clutch cable is correctly routed on the cable guides as shown above.
Starter Cable
Make it sure that the clutch cable does not come in contact with cylinder head at this point.
Tighten wiring harness together with clutch cable.

WIRING DIAGRAM



GS850GX/GLX

This section gives service data and servicing procedures which differ those of the GS850GT/GLT and describes the new features of the GS850GX/GLX. Refer to the sections 1 through 15 except for the items described in this section.

CONTENTS

I VIEW OF SUZUKI GS850GX 16- 2
SPECIFICATIONS 16- 3
SERVICE DATA 16- 5
TORQUE TABLE 16-15
SPECIAL MATERIALS 16-18
PERIODIC MAINTENANCE 16-20
CAMSHAFT, SPROCKET AND BOLT 16-21
DRIVEN GEAR SHIFT FORK 16-22
GEAR SHIFTING SPRING 16-22
UNIVERSAL JOINT FLANGE AND PROPELLER SHAFT 16-23
TURN SIGNAL LIGHT 16-24
WIRE AND CABLE ROUTING 16-25
WIRING DIAGRAM 16-27
II VIEW OF SUZUKI GS850GLX 16-28
SPECIFICATIONS 16-29
SERVICE DATA 16-31
OIL JET 16-33
FUEL COCK 16-34
FRONT FORK 16-35
WIRE AND CABLE ROUTING 16-44
WIRING DIAGRAM 16-46

1 VIEW OF SUZUKI GS850GX

Right side

Left side

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 230 mm (87.8 in)
Overall width	865 mm (34.1 in)
Overall height	1 190 mm (46.9 in)
Wheelbase	1 500 mm (59.1 in)
Ground clearance	160 mm (6.3 in)
Seat height	830 mm (32.7 in)
Dry mass	253 kg (558 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm^3 (51.4 cu. in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS32SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 30′
Trail	113 mm (4.45 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50H19 4PR
Rear tire size	4.50H17 4PR
Front tire pressure	1.75 kg/cm² (25 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve	22 L (5.8 US gal)
reserve	4.2 L (4.4 US qt)
Engine oil change	2.8 L (3.0 US qt)
filter change	3.6 L (3.8 US qt)
overhaul	3.8 L (4.0 US qt)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure	0.6 kg/cm² (8.5 psi)
Front fork oil	251 ml (8.48 US oz) in each leg

* Specifications subject to change without notice.

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	36.0 (1.42)	—
	EX.	30.0 (1.18)	—
Valve lift	IN.	8.0 (0.31)	—
	EX.	7.5 (0.30)	—
Valve clearance or Tappet clearance (when cold)	IN.& EX.	0.03 – 0.08 (0.001 – 0.003)	—
Valve guide to Valve stem clearance	IN.	0.025 – 0.055 (0.0009 – 0.0022)	0.35 (0.014)
	EX.	0.040 – 0.070 (0.0016 – 0.0028)	0.35 (0.014)
Valve guide I.D.	IN.& EX.	7.000 – 7.015 (0.2756 – 0.2762)	—
Valve stem O.D.	IN.	6.960 – 6.975 (0.2740 – 0.2746)	—
	EX.	6.945 – 6.960 (0.2734 – 0.2740)	—
Valve stem runout	IN.& EX.	—	0.05 (0.002)
Valve head thickness	IN.& EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0 – 1.2 (0.04 – 0.05)	—
Valve head radial runout	IN.& EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	33.9 (1.33)
	OUTER	—	41.3 (1.63)
Valve spring tension (IN. & EX.)	INNER	29.3 – 34.0 kg (64.59 – 74.96 lbs) at length 23 mm (0.91 in)	—
	OUTER	50.4 – 58.3 kg (111.11 – 128.53 lbs) at length 27 mm (1.06 in)	—

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.320 – 36.360 (1.4299 – 1.4315)	36.020 (1.4181)
	EX.	35.770 – 35.810 (1.4083 – 1.4098)	35.470 (1.3965)
Camshaft journal oil clearance	IN. & EX.	0.037 – 0.065 (0.0015 – 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012 – 22.025 (0.8666 – 0.8671)	———
Camshaft journal O.D.	IN. & EX.	21.960 – 21.975 (0.8646 – 0.8652)	———
Camshaft runout	IN. & EX.	———	0.1 (0.004)
Cam chain 20 pitch length		———	157.80 (6.213)
Cam chain pin (at arrow "3")		20 th pin	———
Cylinder head distortion		———	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	9 – 12 kg/cm² (128 – 171 psi)			7 kg/cm² (100 psi)
Compression pressure difference	—			2 kg/cm² (28 psi)
Piston to Cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)			0.120 (0.0047)
Cylinder bore	69.000 – 69.015 (2.7165 – 2.7171)			69.080 (2.7197)
Piston diam.	68.945 – 68.960 (2.7144 – 2.7150) Measure the 15 (0.59) from piston skirt end.			68.880 (2.7118)
Cylinder distortion	—			0.2 (0.008)
Piston ring free end gap	1st	N	Approx. 9.0 (0.35)	7.2 (0.28)
	2nd	N	Approx. 9.5 (0.37)	7.6 (0.30)
Piston ring end gap	1st		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
	2nd		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
Piston ring groove clearance	1st		—	0.18 (0.0071)
	2nd		—	0.15 (0.0059)
Piston ring groove width	1st		1.21 – 1.23 (0.047 – 0.048)	—
	2nd		1.21 – 1.23 (0.047 – 0.048)	—
	Oil		2.51 – 2.53 (0.099 – 0.100)	—
Piston ring thickness	1st		1.175 – 1.190 (0.0463 – 0.0469)	—
	2nd		1.170 – 1.190 (0.0461 – 0.0469)	—
Piston pin bore I.D.	16.002 – 16.008 (0.6300 – 0.6302)			16.030 (0.6311)
Piston pin O.D.	15.995 – 16.000 (0.6297 – 0.6300)			15.980 (0.6291)

CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.006 – 16.014 (0.6302 – 0.6305)	16.040 (0.6315)
Conrod deflection	———	3.0 (0.12)
Conrod big end side clearance	0.10 – 0.65 (0.004 – 0.026)	1.0 (0.039)
Crankshaft runout	———	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	———
Oil pressure (at 60° C, 140° F)	Above 0.1 kg/cm² (1.4 psi) Below 0.5 kg/cm² (7.1 psi) at 3 000 r/min	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2 – 3 (0.08 – 0.12)	———
Drive plate thickness	2.7 – 2.9 (0.106 – 0.114)	2.4 (0.094)
Drive plate claw width	11.8 – 12.0 (0.46 – 0.47)	11.0 (0.43)
Driven plate thickness	2.0 ± 0.06 (0.08 ± 0.002)	———
Driven plate distortion	———	0.1 (0.004)
Clutch spring free length	———	38.5 (1.52)

TRANSMISSION

Unit: mm (in)

ITEM	STANDARD		LIMIT
Primary reduction	1.775 (87 / 49)		———
Secondary reduction	1.062 (17 / 16)		———
Final reduction	3.090 (34 / 11)		———
Gear ratios	Low	2.500 (35 / 14)	———
	2nd	1.777 (32 / 18)	———
	3rd	1.380 (29 / 21)	———
	4th	1.125 (27 / 24)	———
	Top	0.961 (25 / 26)	———
Shift fork to Groove clearance	0.4 – 0.6 (0.016 – 0.024)		0.8 (0.031)
Shift fork groove width	5.45 – 5.55 (0.215 – 0.219)		———
Shift fork thickness	4.95 – 5.05 (0.195 – 0.199)		———

SHAFT DRIVE

Unit: mm (in)

ITEM	STANDARD	LIMIT
Secondary bevel gear backlash	0.08 – 0.13 (0.003 – 0.005)	———
Final bevel gear backlash	0.03 – 0.64 (0.001 – 0.025)	———
Secondary drive bevel gear preload	3 – 5 kg·cm (2.60 – 4.35 lb·in)	———
Secondary driven bevel gear preload	4 – 7 kg·cm (3.45 – 6.05 lb·in)	———
Final drive bevel gear preload	4 – 8 kg·cm (3.45 – 6.95 lb·in)	———

CARBURETOR

Unit: mm (in)

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS32SS
Bore size		32 (1.26)
I. D. No.		45110
Idle r/min.		1 050 ± 100 r/min.
Fuel level		5.0 ± 0.5 (0.20 ± 0.02)
Float height		22.4 ± 1.0 (0.88 ± 0.04)
Main jet	(M. J.)	# 115
Main air jet	(M. A. J.)	1.7
Jet needle	(J. N.)	5D50
Needle jet	(N. J.)	X–5
Pilot jet	(P. J.)	# 40
By pass	(B. P.)	1.0, 0.8, 0.8
Pilot outlet	(P. O.)	0.7
Valve seat	(V. S.)	2.0
Starter jet	(G. S.)	# 32.5
Pilot screw	(P. S.)	PRE-SET
Pilot air jet	(P. A. J.)	# 190
Throttle cable play		0.5 – 1.0 (0.02 – 0.04)

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		
Ignition timing	17° B. T. D. C. Below 1 500 ± 150 r/min. and 37° B. T. D. C. Above 2 350 ± 150 r/min.		
Firing order	1, 2, 4, 3		
Spark plug	Type	NGK : B8ES N. D. : W24ES-U	
	Gap	0.6 – 0.8 (0.024 – 0.031)	
Spark performance	Over 8 (0.3) at 1 atm.		
Signal coil resistance	Approx.	290 – 360 Ω	BI-G
Ignition coil resistance	Primary	O/W – W Approx. 3 – 5Ω	
	Secondary	Plug cap – Plug cap Approx. 31 – 33 kΩ	
Generator No-Load voltage	More than 80 V (AC) at 5 000 r/min.		
Regulated voltage	14.0 – 15.5 V at 5 000 r/min.		
Starter motor	Brush length	Limit: 6 (0.24)	
	Commutator under cut	Limit: 0.2 (0.008)	
Starter relay resistance	3 – 4 Ω		
Battery	Type designation	YB14L – A2	
	Capacity	12V 50.4kC (14Ah)/10HR	
	Standard electrolyte S. G.	1.28 at 20°C (68°F)	
Fuse size	Headlight	10A	
	Turn signal	10A	
	Ignition	10A	
	Main	15A	
	Output terminal	10A	

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		20 (0.8)	—
Brake disc thickness	Front	5.0 ± 0.2 (0.2 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder cylinder bore	Front	15.870 – 15.913 (0.6248 – 0.6265)	—
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston diam.	Front	15.827 – 15.854 (0.6231 – 0.6242)	—
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	—
Brake caliper cylinder bore	Front	38.180 – 38.256 (1.5031 – 1.5061)	—
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	—
Brake caliper piston diam.	Front	38.098 – 38.148 (1.4999 – 1.5019)	—
	Rear	38.098 – 38.148 (1.4999 – 1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	3.50H19 4PR	—
	Rear	4.50H17 4PR	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	160 (6.3)	———
Front fork spring free length	———	416 (16.4)
Front fork oil level	140 (5.5)	———
Front fork air pressure	0.6 kg/cm^2 (8.5 psi)	———
Rear wheel travel	100 (3.9)	———

FUEL + OIL + CAPACITY

ITEM	SPECIFICATION	
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve	22 L (5.8 US gal)	
reserve	4.2 L (4.4 US qt)	
Engine oil type	SAE 10W/40	
Engine oil capacity	Change	2 800 ml (3.0 US qt)
	Filter change	3 600 ml (3.8 US qt)
	Overhaul	3 800 ml (4.0 US qt)
Front fork oil type	Fork oil #15	
Front fork oil capacity (each leg)	251 ml (8.48 US oz)	
Bevel gear oil type	Hypoid Gear oil SAE 90, API grade GL-5	
Bevel gear oil capacity	Secondary	340 – 400 ml (11.5 – 13.5 US oz)
	Final	280 – 330 ml (9.5 – 11.2 US oz)
Brake fluid type	DOT3 or DOT4	

TIRE PRESSURE

GOLD INFLATION TIRE PRESSURE	NORMAL RIDING				CONTINUOUS HIGH SPEED RIDING			
	SOLO RIDING		DUAL RIDING		SOLO RIDING		DUAL RIDING	
	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi
FRONT	1.75	25	1.75	25	2.00	28	2.00	28
REAR	2.00	28	2.25	32	2.25	32	2.80	40

WATTAGE

Unit: W (cp)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
Turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
License light		8

TORQUE TABLE

ENGINE

ITEM	kg-m	lb-ft
Cylinder head cover bolt	0.6 – 1.0	4.5 – 7.0
Cylinder head bolt	0.7 – 1.1	5.0 – 8.0
Cylinder head nut	3.5 – 4.0	25.5 – 29.0
Camshaft bearing cap bolt	0.8 – 1.2	6.0 – 8.5
Camshaft sprocket bolt	2.4 – 2.6	17.5 – 19.0
Cam chain idler bolt	0.6 – 1.0	4.5 – 7.0
Cam chain guide No. 2 bolt	0.4 – 0.7	3.0 – 5.0
Generator rotor bolt	6.0 – 7.0	43.5 – 50.5
Advance governor bolt	1.8 – 2.3	13.0 – 16.5
Starter motor bolt	0.4 – 0.7	3.0 – 5.0
Starter clutch bolt	1.5 – 2.0	11.0 – 14.5
Clutch sleeve hub nut	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	1.1 – 1.3	8.0 – 9.5
Clutch release arm bolt	0.6 – 1.0	4.5 – 7.0
Oil strainer screw	0.6 – 1.0	4.5 – 7.0
Gear shifting cam stopper spring holder bolt	1.8 – 2.8	13.0 – 20.0
Gear shift arm stopper bolt	1.5 – 2.3	11.0 – 16.5
Crankcase bolt (6 mm)	0.6 – 1.0	4.5 – 7.0
Crankcase bolt (8 mm)	1.8 – 2.2	13.0 – 16.0
Engine mounting nut (10 mm)	2.5 – 4.5	18.0 – 32.5
Engine mounting nut (12 mm)	4.5 – 7.0	32.5 – 50.5
Exhaust pipe bolt	0.9 – 1.4	6.5 – 10.0
Muffler bolt	1.8 – 2.8	13.0 – 20.0
Gear shift lever bolt	1.3 – 2.3	9.5 – 16.5
Secondary drive gear nut	12.0 – 15.0	87.0 – 108.5
Secondary driven gear nut	9.0 – 11.0	65.0 – 79.5
Secondary drive housing bolt	2.0 – 2.6	14.5 – 19.0
Secondary driven housing bolt	2.0 – 2.6	14.5 – 19.0

CHASSIS

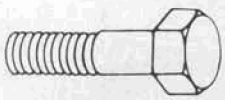
ITEM	kg-m	lb-ft
Handlebar clamp bolt	1.2 – 2.0	8.5 – 14.5
Steering stem upper clamp bolt	1.5 – 2.5	11.0 – 18.0
Front fork upper bracket bolt (R, L)	2.0 – 3.0	14.5 – 21.5
Front fork lower bracket bolt (R, L)	1.5 – 2.5	11.0 – 18.0
Steering stem head nut	3.5 – 5.0	25.5 – 36.0
Front fork axle holder nut	1.5 – 2.5	11.0 – 18.0
Front axle shaft nut	3.6 – 5.2	26.0 – 37.5
Swinging arm pivot bolt	0.35 – 0.45	2.5 – 3.0
Swinging arm pivot nut	11.0 – 13.0	79.5 – 94.0
Rear torque link nut	2.0 – 3.0	14.5 – 21.5
Rear axle nut	5.0 – 8.0	36.0 – 58.0
Rear shock absorber nut	2.0 – 3.0	14.5 – 21.5
Footrest bolt	2.7 – 4.3	19.5 – 31.0
Front brake caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Front and rear brake disc plate bolt	1.5 – 2.5	11.0 – 18.0
Front brake caliper axle bolt	1.5 – 2.0	11.0 – 14.5
Front brake master cylinder mounting bolt	0.5 – 0.8	3.5 – 6.0
Front and rear brake hose union bolt	1.3 – 1.8	9.5 – 13.0
Front and rear brake oil bleeder bolt	0.6 – 0.9	4.5 – 6.5
Rear brake caliper mounting bolt	2.0 – 3.0	14.5 – 21.5
Rear brake caliper axle bolt	2.5 – 3.5	18.0 – 25.5
Rear brake master cylinder mounting bolt	1.5 – 2.5	11.0 – 18.0
Final drive gear nut	9.0 – 11.0	65.0 – 79.5
Final drive gear housing nut	3.5 – 4.5	25.5 – 32.5
Propeller shaft bolt	3.0 – 4.0	21.5 – 29.0
Final gear bearing case bolt	2.0 – 2.6	14.5 – 19.0
Final gear case shock mount stud bolt	9.0 – 11.0	65.0 – 79.5
Final case oil filler plug	2.0 – 3.0	14.5 – 21.5

TIGHTENING TORQUE CHART

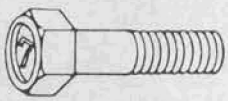
For other bolts and nuts not listed on previous pages, refer to this chart:

TIGHTENING TORQUE

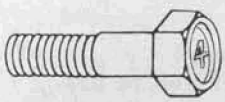
Thread Diameter (mm)	Conventional or "4" Marked Bolt		"7" Marked Bolt	
	kg-m	lb-ft	kg-m	lb-ft
4	0.1 – 0.2	0.7 – 1.5	0.15 – 0.3	1.0 – 2.0
5	0.2 – 0.4	1.5 – 3.0	0.3 – 0.6	2.0 – 4.5
6	0.4 – 0.7	3.0 – 5.0	0.8 – 1.2	6.0 – 8.5
8	1.0 – 1.6	7.0 – 11.5	1.8 – 2.8	13.0 – 20.0
10	2.2 – 3.5	16.0 – 25.5	4.0 – 6.0	29.0 – 43.5
12	3.5 – 5.5	25.5 – 40.0	7.0 – 10.0	50.5 – 72.5
14	5.0 – 8.0	36.0 – 58.0	11.0 – 16.0	79.5 – 115.5
16	8.0 – 13.0	58.0 – 94.0	17.0 – 25.0	123.0 – 181.0
18	13.0 – 19.0	94.0 – 137.5	20.0 – 28.0	144.5 – 202.5



Conventional Bolt



"7" Marked Bolt

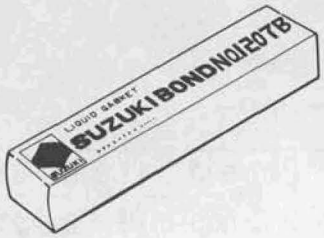
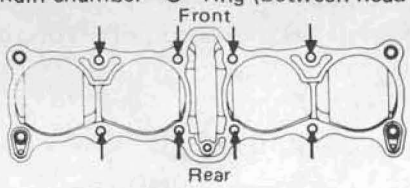
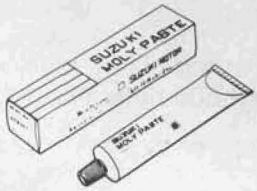


"4" Marked Bolt

SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GS850G, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

Material	Part
 99000-25030 SUZUKI SUPER GREASE "A"	* Oil seals * Throttle grip * Cables (Speedometer and tachometer) * Clutch release mechanism * Wheel bearings * Swinging arm bearing * Steering stem bearing
 99000-32040 THREAD LOCK CEMENT	* Oil filter cover nut . . . . . 3 pcs * Camshaft end cap screw . . . . . 8 pcs * Front fork allen bolt . . . . . 2 pcs * Carburetor adjuster bracket screw. . . . . 2 pcs * Carburetor plate screw . . . . . 8 pcs * Carburetor starter shaft screw . . . . . 4 pcs
 99000-32050 THREAD LOCK "1342"	* Gearshift cam guide screw. . . . . 2 pcs * Gearshift pawl screw . . . . . 2 pcs * Countershaft B/G retainer screw . . . . . 3 pcs * Driveshaft plate screw . . . . . 3 pcs * Generator starter screw . . . . . 3 pcs * Generator lead wire guide screw. . . . . 3 pcs * Engine oil pump screw . . . . . 4 pcs * Oil gallery plate screw . . . . . 3 pcs * Secondary drive bevel gear assy set bolt. . . . . 4 pcs * Secondary driven bevel gear assy set bolt . . . . . 4 pcs * Final bevel gear bearing holder screw. . . . . 3 pcs * Final bearing case bolt . . . . . .10 pcs
 99000-32020 THREAD LOCK SUPER "1333B"	* Thread portion of secondary driven gear * Thread portion of final drive gear * Propeller shaft joint bolt. . . . . 4 pcs * Stater clutch allen bolt. . . . . 3 pcs * Cam chain guide bolt . . . . . 3 pcs * Gearshift stopper. . . . . 1 pc

Material	Part
 99000-32030 THREAD LOCK SUPER "1303"	* Cam sprocket bolt. . . . . 4 pcs
 99104-31140 SUZUKI BOND No. 1207B	* Cylinder stud bolt . . . . . 8 pcs (Apply a small quantity to the threads of cylinder stud bolts.) Cam chain chamber "O" ring (between head and cylinder)  * Mating surfaces of upper and lower crank case. * Final gear case * Joint portion of rear swinging arm and final gear case.
 99000-25100 SUZUKI SILICONE GREASE	* Apply to caliper axle shaft
 99000-25140 SUZUKI MOLY PASTE	* Valve stem * Camshaft journal * Chain tensioner adjuster shaft * Counter shaft washer * Outer counter shaft * Input cam dog

PERIODIC MAINTENANCE

IMPORTANT: The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also enhance the reliability and performance of the motorcycle.

NOTE:
More frequent servicing may be performed on motorcycles that are used under extreme severe comditions, however, it is not necessary to ensure emission level compliance.

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and to maintain proper emission levels. Mileages are expressed in terms of kilometers, miles and time for your convenience.

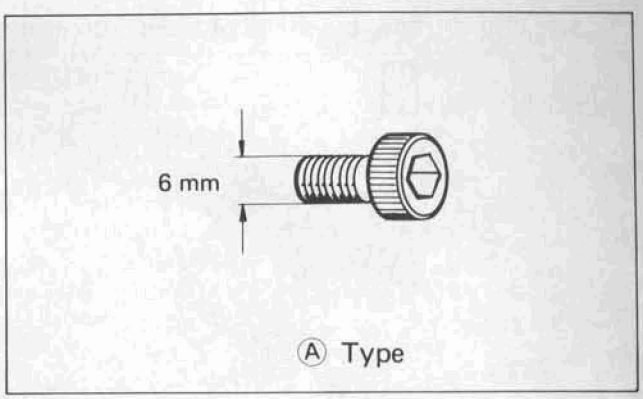
PERIODIC MAINTENANCE SCHEDULE

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST	Mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		–	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		–	C	C	C	C
Tappet clearance		I	I	I	I	I
Spark plug		–	C	R	C	R
Fuel line		Replace every two years				
Engine oil and oil filter		R	R	R	R	R
Engine idle speed		I	I	I	I	I
Clutch		I	I	I	I	I
Secondary and Final gear oil		Change oil at initial 600 miles (1 000 km) every 7 500 miles (12 000 km)				
Brake hose		Replace every two years				
Brake		I	I	I	I	I
Tires		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front forks		–	–	I	–	I
		Check air pressure every 6 months.				

NOTE: T = Tighten, I = Inspect, R = Replace, C = Clean

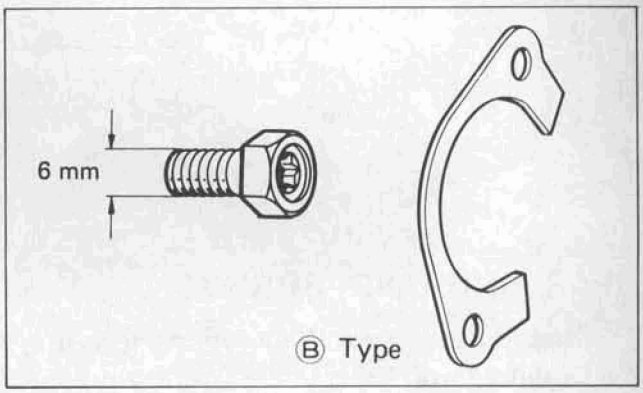
CAMSHAFT SPROCKET AND BOLT

As illustrated, the sprocket tightening bolt and method has been changed from Ⓐ to Ⓑ, to Ⓒ. Therefore, tightening torque should be observed.



Ⓐ Type

Part Name	Tightening torque
6 mm Allen bolt + Thread lock Super "1303"	0.8 – 1.2 kg-m (6.0 – 8.5 lb-ft)

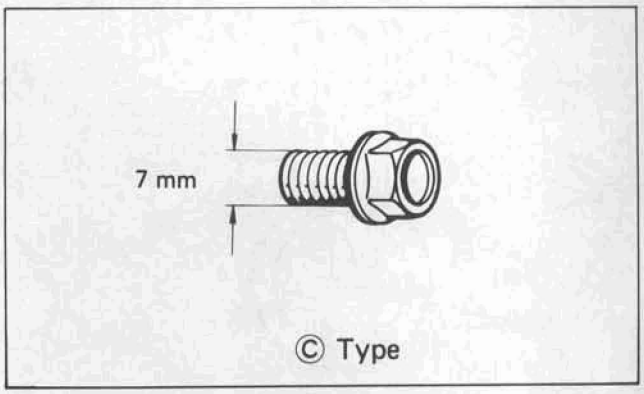


Ⓑ Type

Part Name	Tightening torque
6 mm bolt + Lock washer + Thread lock Super "1303"	1.5 – 2.0 kg-m (11.0 – 14.5 lb-ft)

Ⓒ Type

Part Name	Tightening torque
7 mm flnage bolt + Thread lock Super "1303"	2.4 – 2.6 kg-m (17.5 – 19.0 lb-ft)



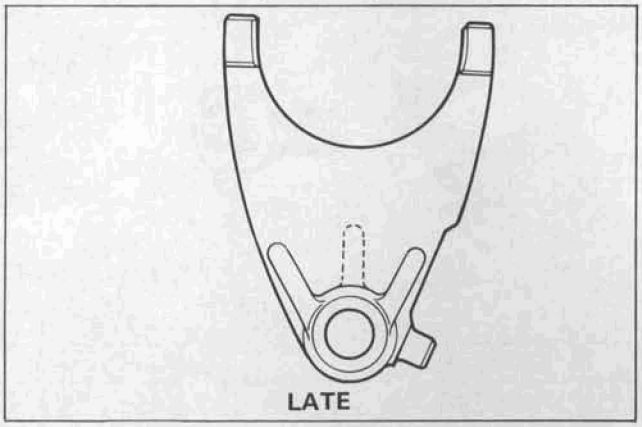
Part Name	Ⓐ Type Part Number	Ⓑ Type Part Number	Ⓒ Type Part Number
Bolt	09106 - 06024	09111 - 06033	09103 - 07001
Lock washer	——	12747 - 44000	——
IN, Cam sprocket	12741 - 45110	←	12741 - 45111
IN, Camshaft	12711 - 45110	←	12711 - 45111
EX, Cam sprocket	12750 - 45041	←	12751 - 45002
EX, Camshaft	12721 - 49000	←	12721 - 49001

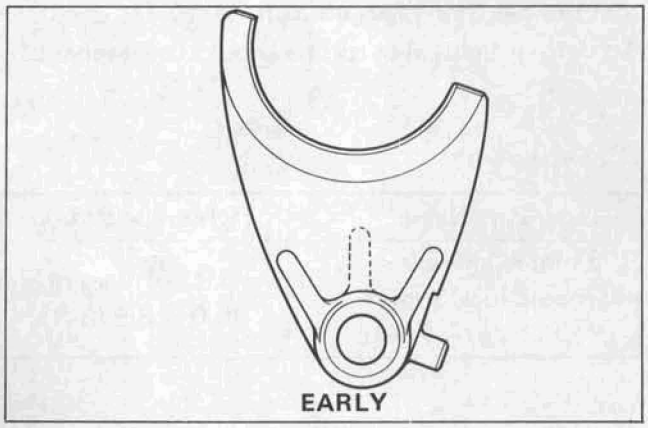
INTERCHANGEABILITY

Both Ⓐtype and Ⓑ type have an interchangeability by exchanging bolt for lock washer + bolt.
However Ⓒtype has screw thread diameter of 7 mm, and bore diameters of the sprocket and the camshaft are also 7 mm, so there is no interchangeability with neither Ⓐ type nor Ⓑtype.

DRIVEN GEAR SHIFT FORK

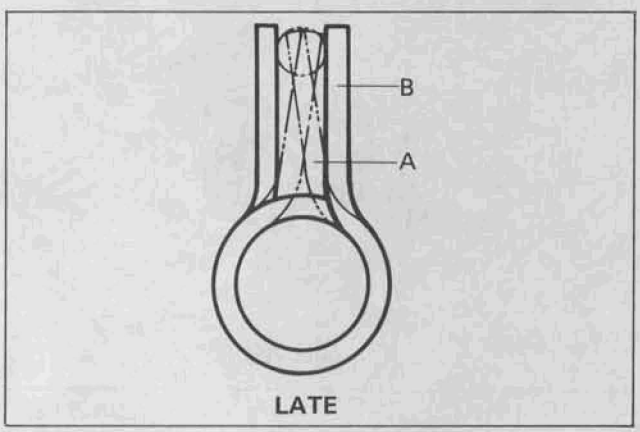
For sure gear shifting, the shape of the driven gear shift fork has been changed as shown below:

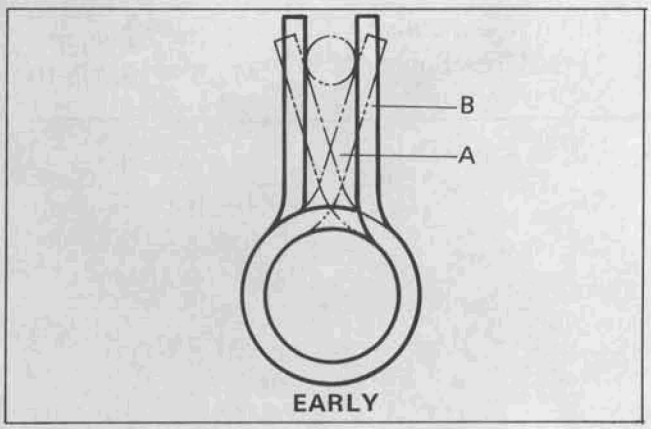




GEAR SHIFTING SPRING

The shape of the gear shifting spring (when it is set free) has been changed as shown below so that gears can be shifted with less effort.



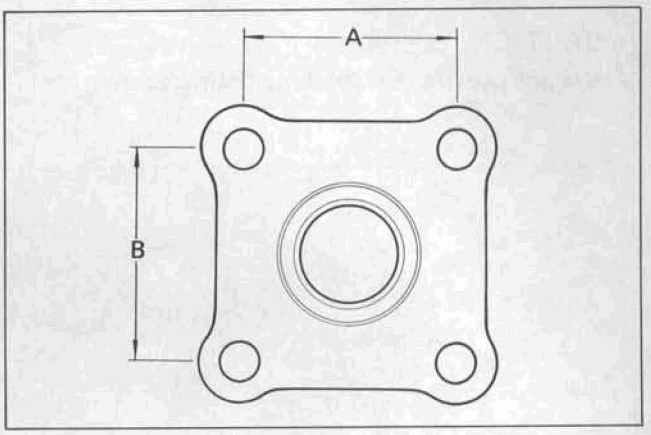


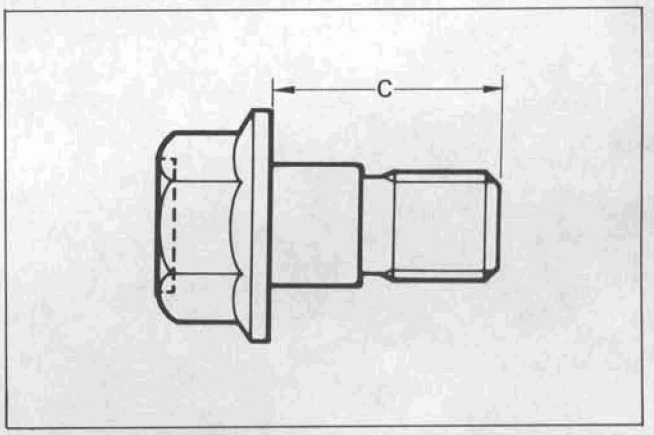
A: Shape of the spring (when it is set free)
B: Shape of the spring (when it is installed)

UNIVERSAL JOINT FLANGE AND PROPELLER SHAFT

The shape of the joint area of the universal joint flange with the propeller shaft, along with the pitch, has been changed, and at the same time, the bolt has been modified.

	LATE	EARLY
A & B	46.7 mm (1.84 in)	42.0 mm (1.65 in)
C	17.0 mm (0.67 in)	16.0 mm (0.63 in)

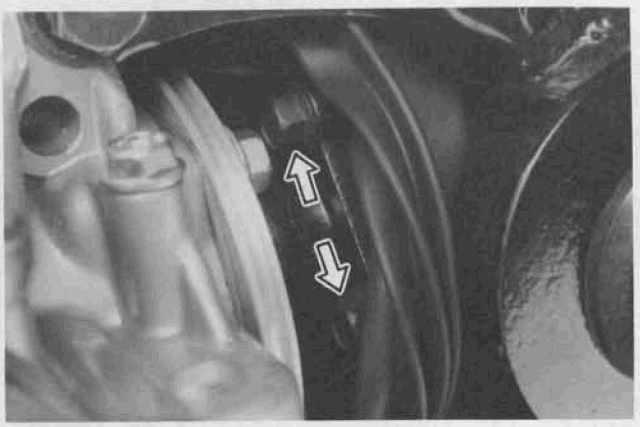




When the universal flange bolt is reused, it should be coated with Thread Lock Super "1361A" and tightened to specification.

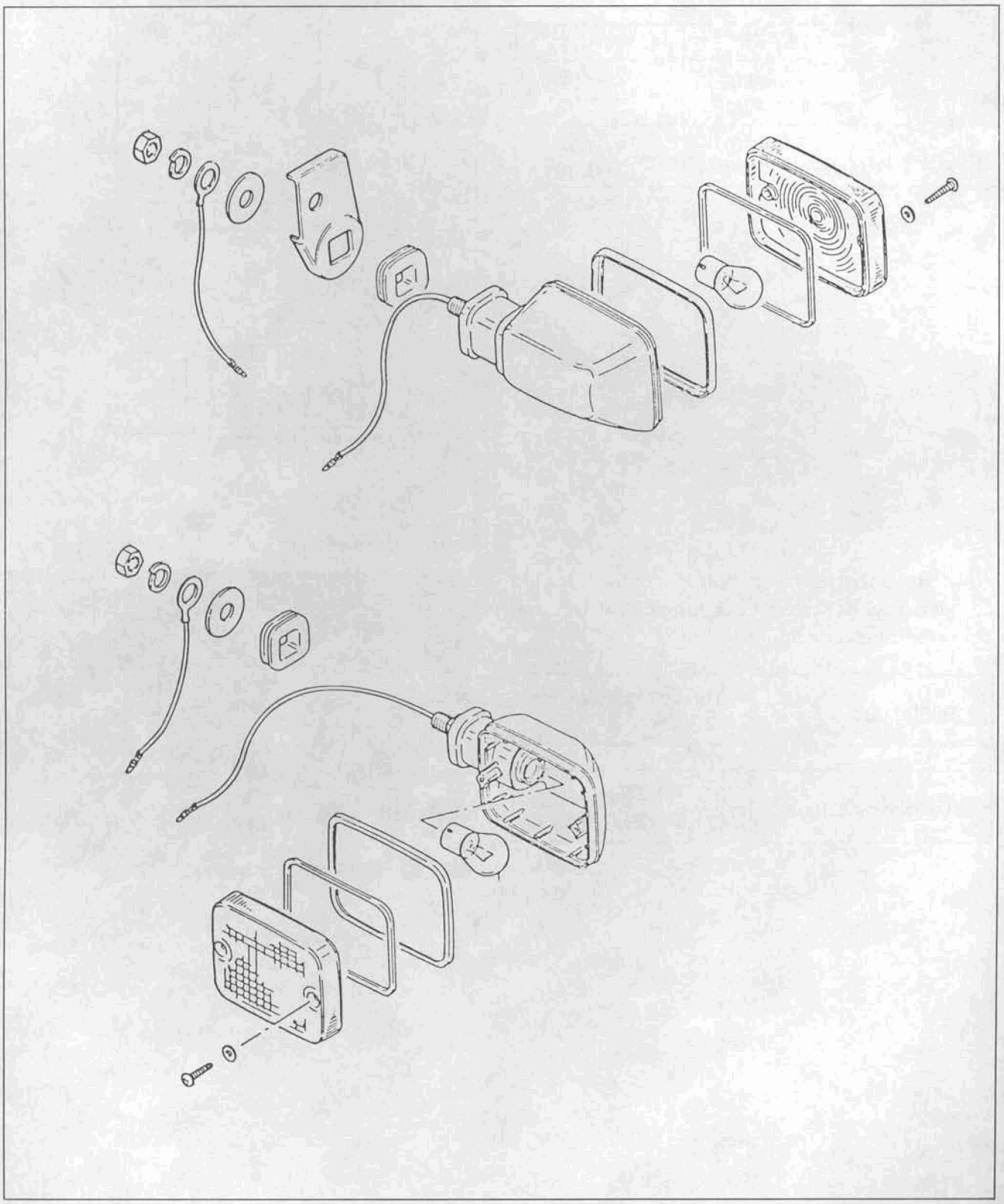
99000 - 32020	Thread Lock Super "1333B"

Tightening torque	3.0 – 4.0 kg-m (21.5 – 29.0 lb-ft)

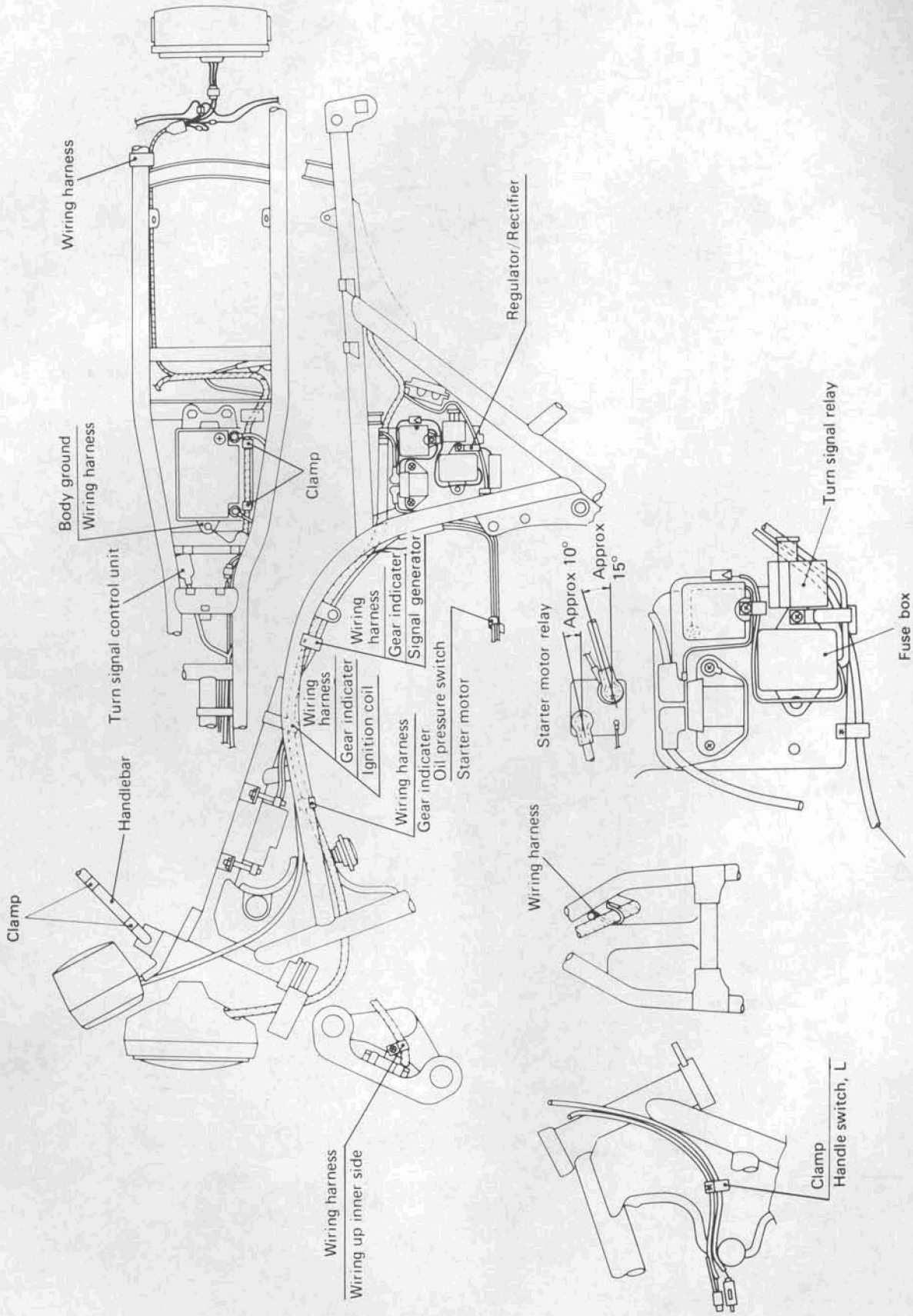


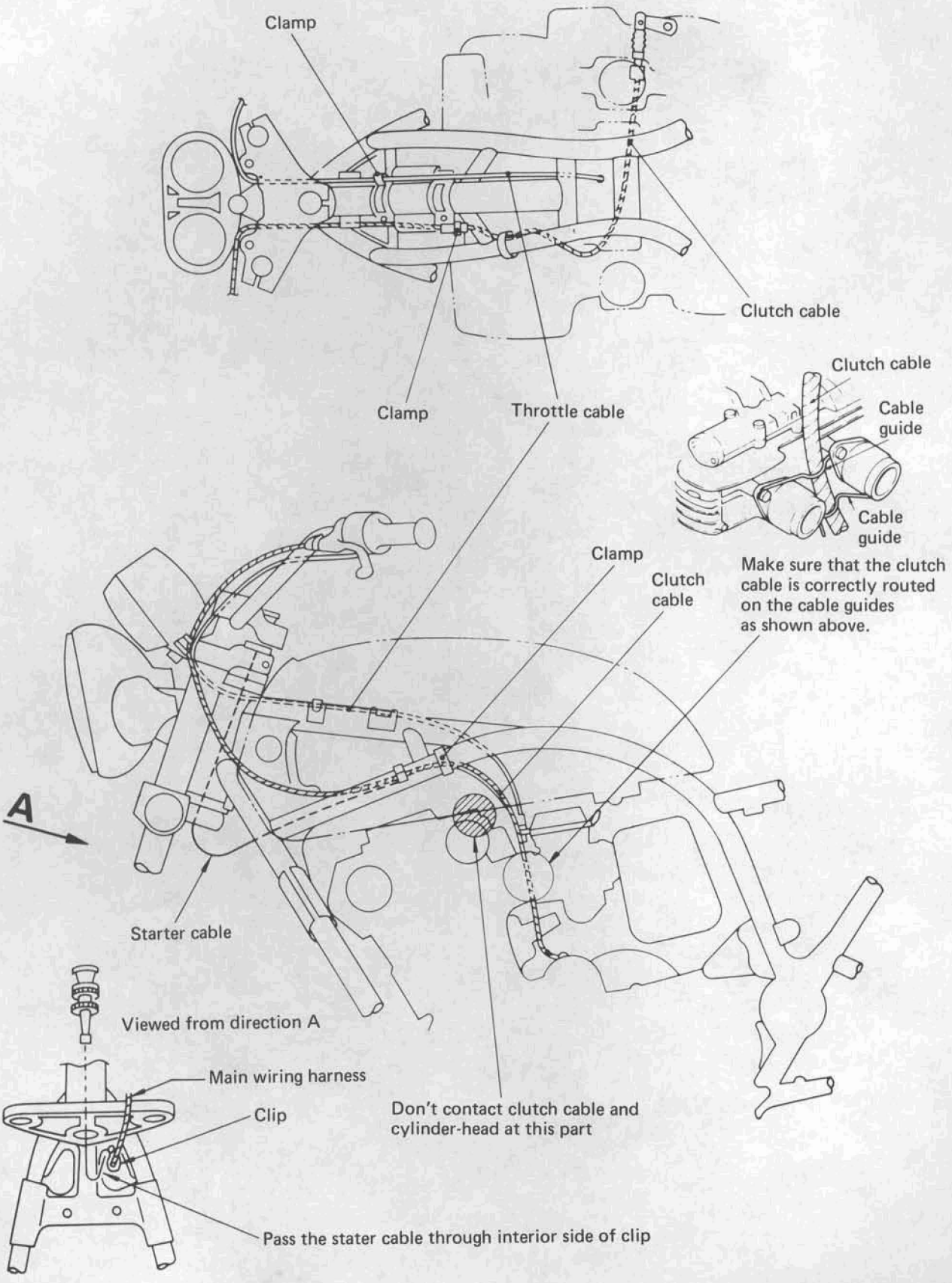
TURN SIGNAL LIGHT (Front and Rear)

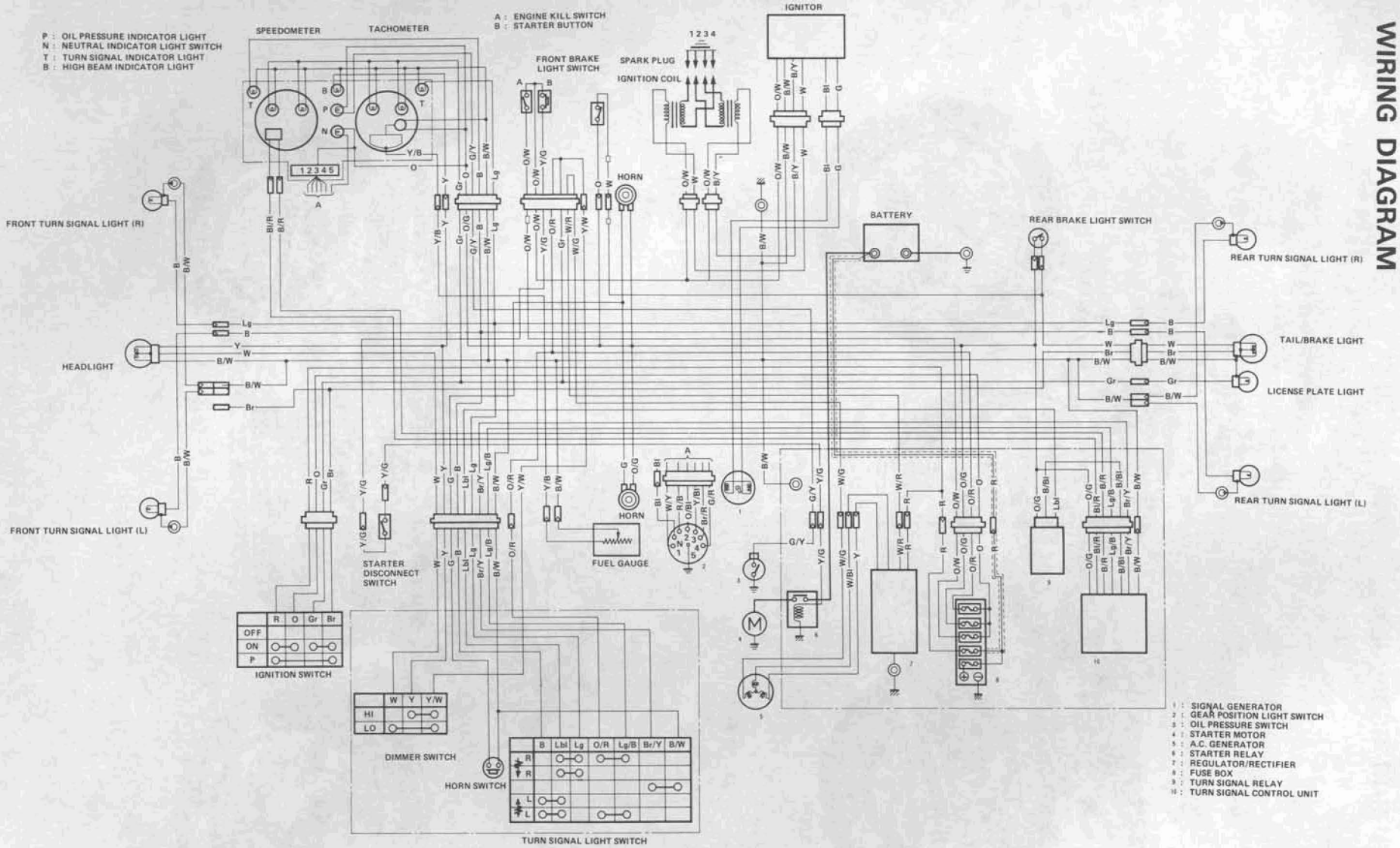
CAUTION:
Do not overtighten the lens fitting screws.



WIRE AND CABLE ROUTING



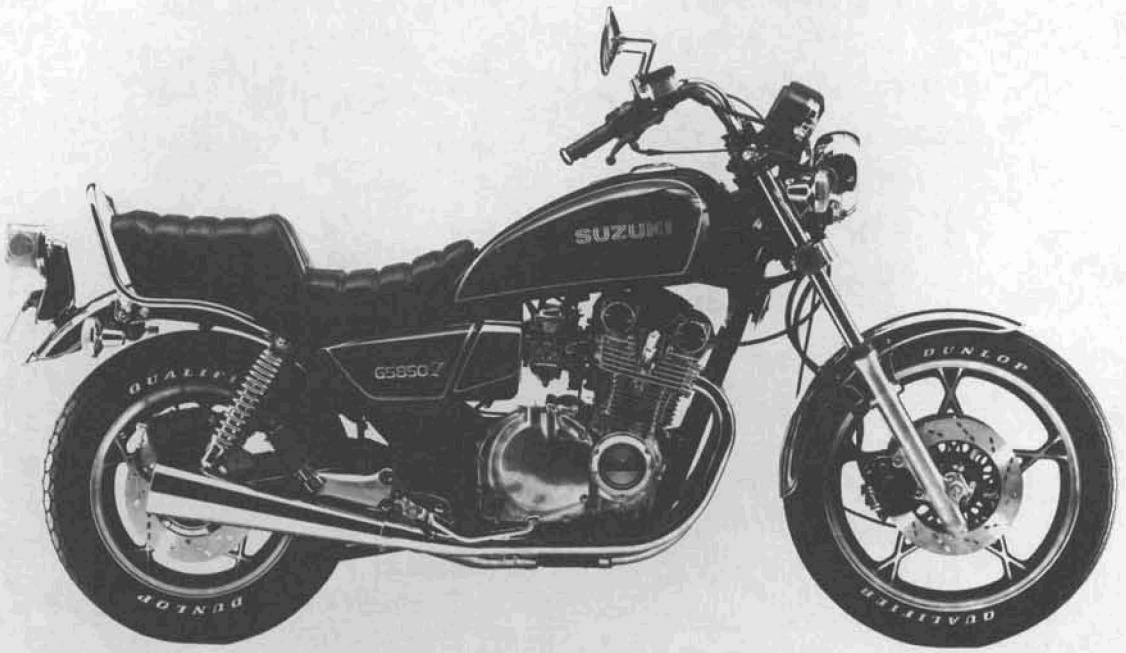

Clamp
Clutch cable
Clamp
Throttle cable
Clutch cable
Cable guide
Cable guide
Make sure that the clutch cable is correctly routed on the cable guides as shown above.
Clamp
Clutch cable
A
Starter cable
Viewed from direction A
Main wiring harness
Clip
Don't contact clutch cable and cylinder-head at this part
Pass the stater cable through interior side of clip



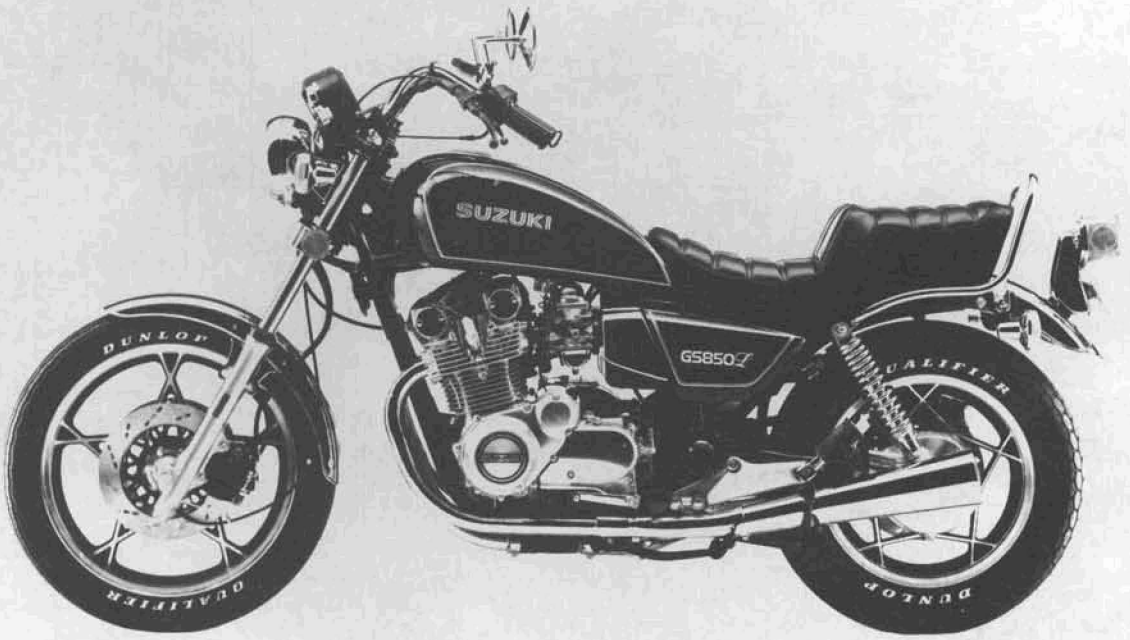
WIRE COLOR

B . . . . . Black	R . . . . . Red	Br/R . . . Brown with Red tracer	G/W . . . Grren with White tracer	W/G . . . White with Green tracer
Bl . . . . . Blue	W . . . . . White	Br/W . . . Brown with White tracer	G/Y . . . Green with Yellow tracer	W/R . . . White with Red tracer
Br . . . . Brown	Y . . . . . Yellow	Br/Y . . . Brown with Yellow tracer	O/R . . . Orange with Red tracer	W/Y . . . White with Yellow tracer
G . . . . . Green	B/Bl . . . Black with Blue tracer	G/B . . . Green with Black tracer	O/W . . . Orange with White tracer	Y/B . . . Yellow with Black tracer
Gr . . . . Gray	B/R . . . Black with Red tracer	Gr/B . . . Gray with Black tracer	R/B . . . Red with Black tracer	Y/Bl . . . Yellow with Blue tracer
Lbl . . . . Light blue	B/W . . . Black with White tracer	Lg/B . . . Light green with Black tracer	R/Bl . . . Red with Blue tracer	Y/G . . . Yellow with Green tracer
Lg . . . . Light green	B/Y . . . Black with Yellow tracer	Lg/R . . . Light green with Red tracer	R/G . . . Red with Green tracer	Y/R . . . Yellow with Red tracer
O . . . . . Orange	Bl/R . . . Blue with Red tracer	O/G . . . Orange with Green tracer	R/Y . . . Red with Yellow tracer	Y/W . . . Yellow with White tracer
P . . . . . Pink	Bl/W . . . Blue with White tracer	G/Bl . . . Green with Blue tracer	W/B . . . White with Black tracer	
	Bl/Y . . . Blue with Yellow tracer	G/R . . . Green with Red tracer	W/Bl . . . White with Blue tracer	

II VIEW OF SUZUKI GS850GLX



Right side



Left side

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 250 mm (88.6 in)
Overall width	855 mm (33.7 in)
Overall height	1 130 mm (44.5 in)
Wheelbase	1 510 mm (59.4 in)
Ground clearance	145 mm (5.7 in)
Seat height	750 mm (29.5 in)
Dry mass	243 kg (536 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm^3 (51.4 cu. in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS32SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.722 (31/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.923 (24/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 30′
Trail	105 mm (4.13 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	100/90-19 57H (Tubeless tire)
Rear tire size	130/90-16 67H (Tubeless tire)
Front tire pressure	1.75 kg/cm² (25 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve		17 L (4.5 US gal)
	reserve	4.5 L (4.8 US qt)
Engine oil	change	3.0 L (3.2 US qt)
	filter change	3.6 L (3.8 US qt)
	overhaul	3.8 L (4.0 US qt)
Secondary bevel gear oil		340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil		280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure		0.8 kg/cm² (11.4 psi)
Front fork oil		245 ml (8.27 US oz) in each leg

* Specifications subject to change without notice.

SERVICE DATA

Please refer to the service data of GS850GX except for the service data shown below.

TRANSMISSION

ITEM	STANDARD	
Gear ratios	2nd	1.722 (31/18)
	Top	0.923 (24/26)

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Rear brake pedal height	15 (0.6)		———
Tire size	Front	100/90-19 57H Tubeless tire	———
	Rear	130/90-16 67H Tubeless tire	———

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork spring free length	———	516 (20.3)
Front fork oil level	260 (10.2)	———
Front fork air pressure	0.8 kg/cm² (11.4 psi)	———
Rear wheel travel	110 (4.3)	———

FUEL + OIL + CAPACITY

ITEM	SPECIFICATION	
Fuel tank including reserve	17 L (4.5 US gal)	
reserve	4.5 L (4.8 US qt)	
Engine oil capacity	Change	3 000 ml (3.2 US qt)
Front fork oil capacity (each leg)	245 ml (8.27 US oz)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING				CONTINUOUS HIGH SPEED RIDING			
	SOLO RIDING		DUAL RIDING		SOLO RIDING		DUAL RIDING	
	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi
FRONT	1.75	25	1.75	25	2.00	28	2.25	32
REAR	2.00	28	2.50	36	2.25	32	2.80	40

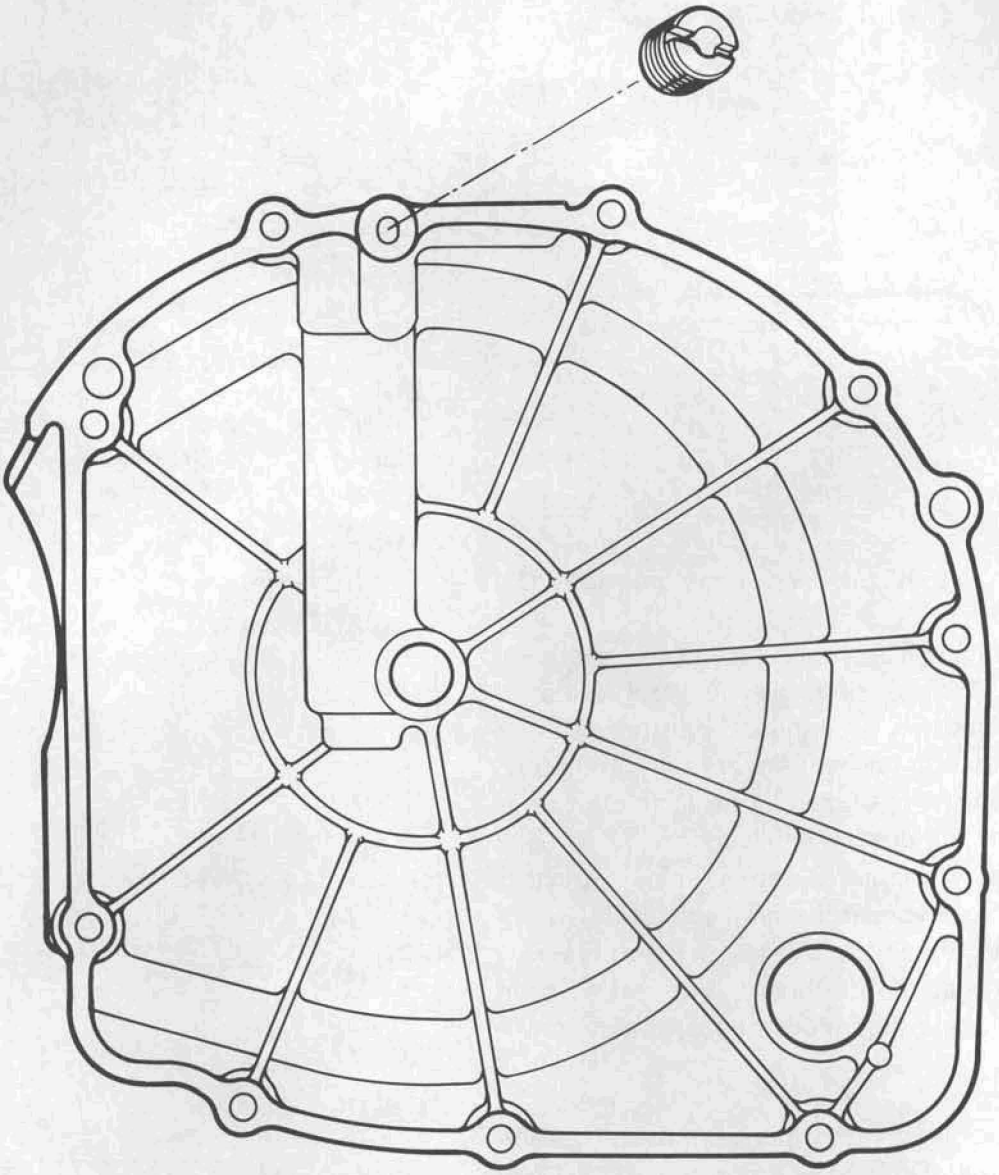
WATTAGE

Unit: W (cp)

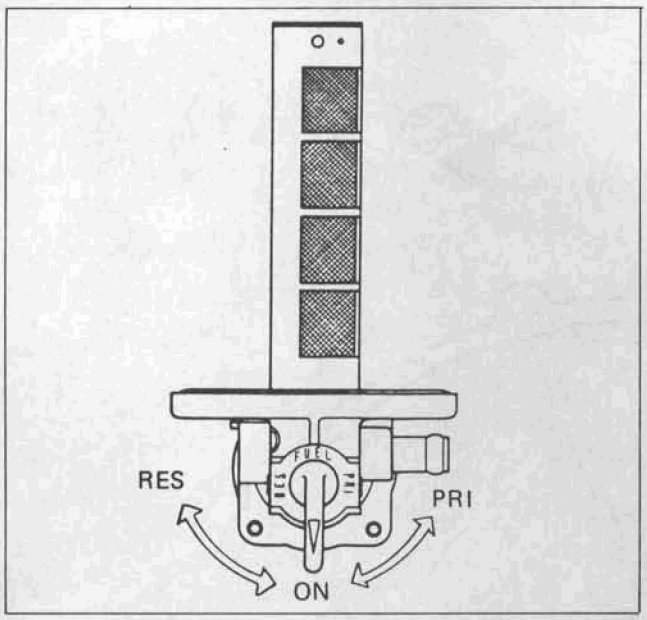
ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
Turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Fuel meter light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4

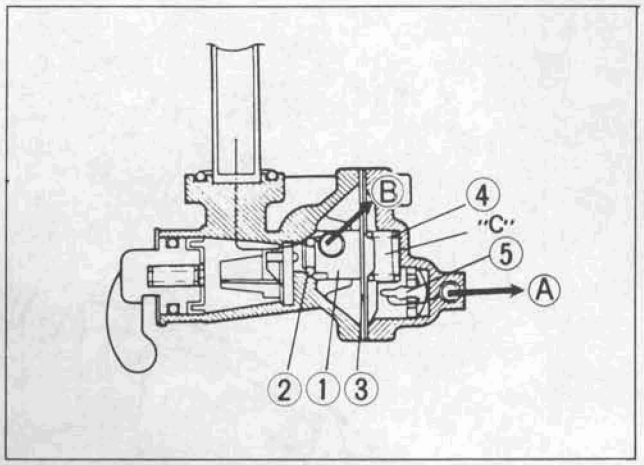
OIL JET

A # 110 oil jet is added to the clutch cover as shown in Fig.



FUEL COCK

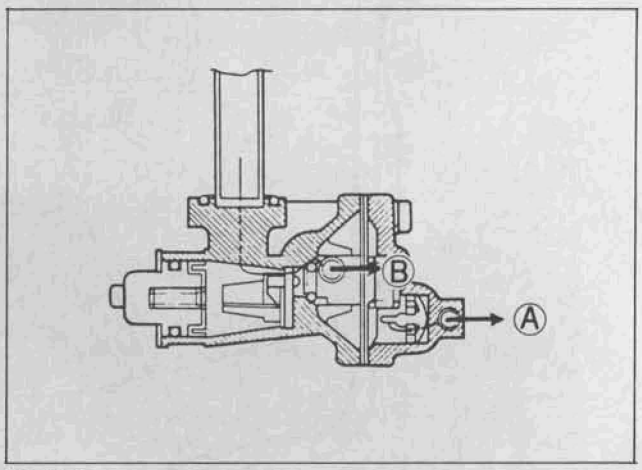




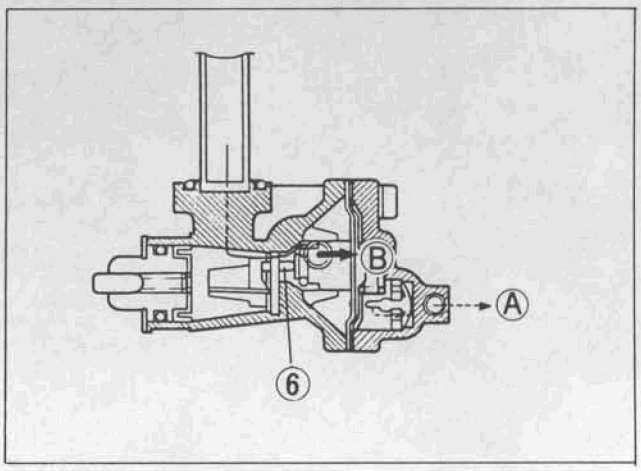
"ON"
① Fuel valve ② O-ring ③ Diaphragm
④ Spring ⑤ One way valve
Ⓐ Vaccum Ⓑ Fuel flow

This fuel cock is provided three position, ON RES and PRI.
When the engine is not running and the lever is in the ON or RES position, the fuel valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is engaged, a negative pressure is generated in the diaphragm chamber "C" through the vacuum (negative pressure) pipe which is connected to the carburetors, and builds up a negative pressure which is stronger than the spring pressure so that the disphragm is forced to open the fuel valve and thus allow the fuel to flow to the carburetors.

When the lever is set to PRI position, the protrusion ⑥ located on the lever end pushes back the fuel valve mechanically against the spring force and it allows fuel to flow to the carburetors directly, whether the engine is running or not through the RES side fuel filtre and fuel valve clearance.

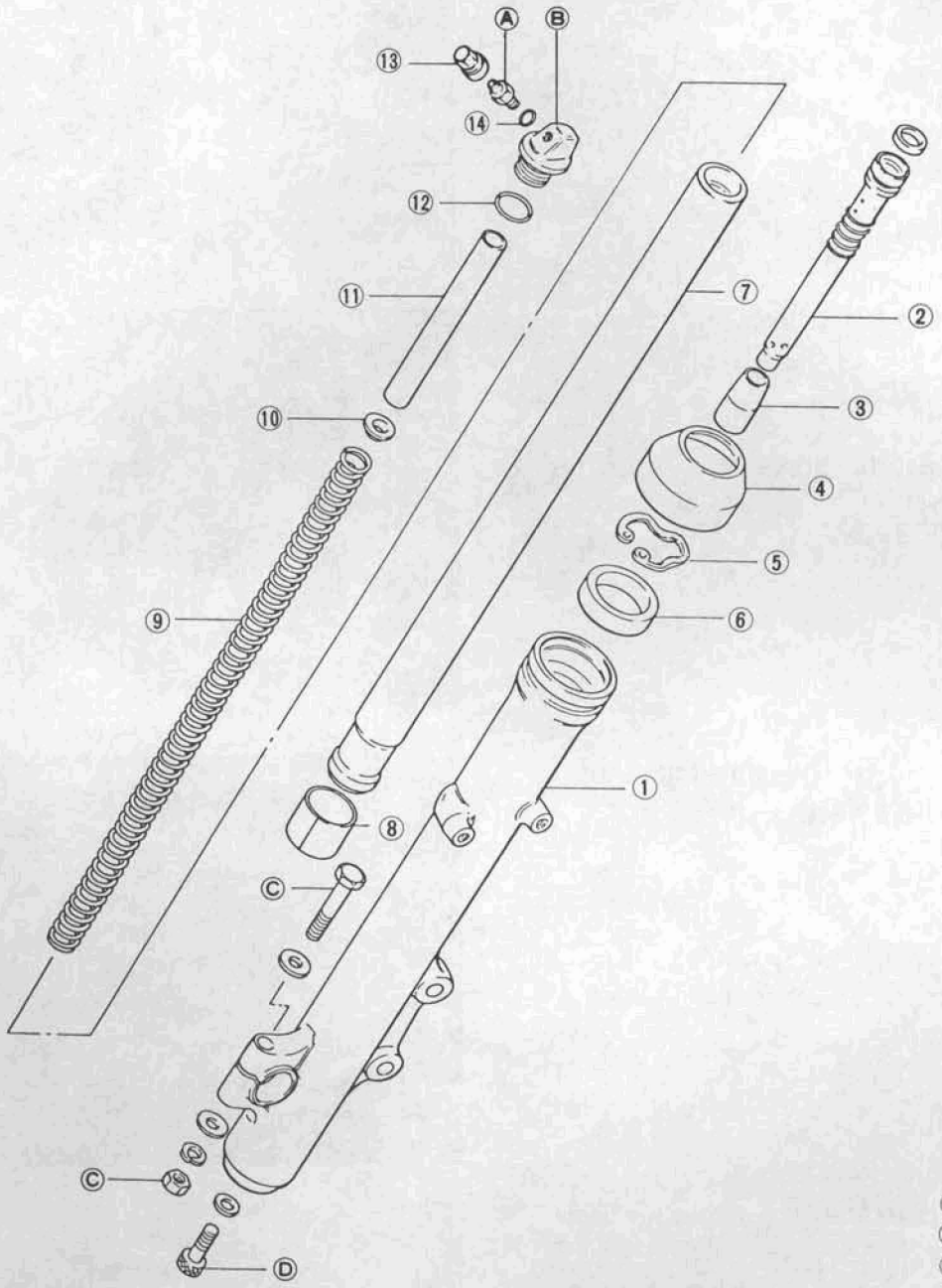


"RES"



"PRI"

FRONT FORK

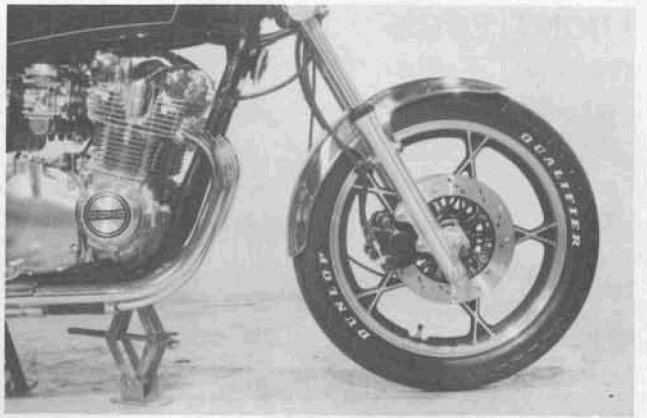


Tightening torque		
	kg-m	lb-ft
A	1.0 – 1.3	7.0 – 9.5
B	1.5 – 3.0	11.0 – 21.5
C	1.5 – 2.5	11.0 – 18.0
D	2.0 – 2.6	14.5 – 19.0

① Outer tube
② Cylinder
③ Oil lock piece
④ Dust seal
⑤ Snap ring
⑥ Oil seal
⑦ Inner tube
⑧ Slide metal
⑨ Spring
⑩ Spring guide
⑪ Spacer
⑫ O-ring
⑬ Cap
⑭ O-ring

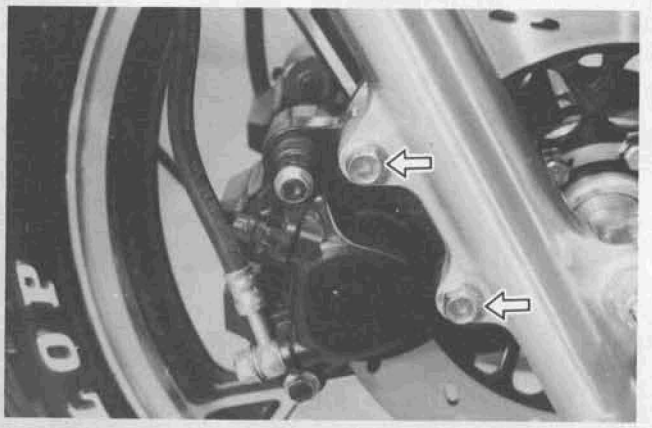
REMOVAL AND DISASSEMBLY

- Support the machine by the centerstand and a jack.

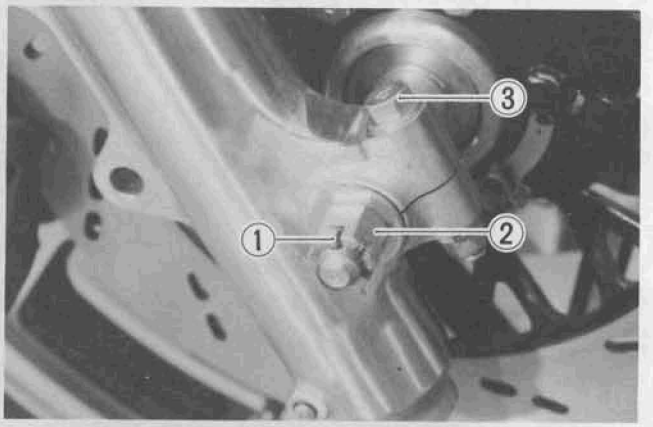


- Remove right and left calipers and speedometer cable guide.

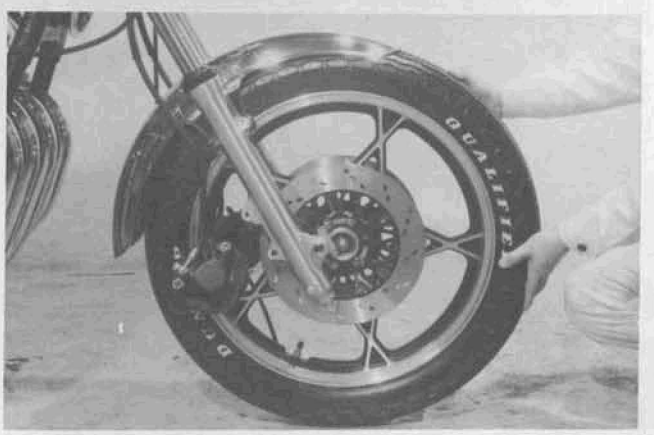
NOTE:
Do not operate the brake lever after the caliper is removal.



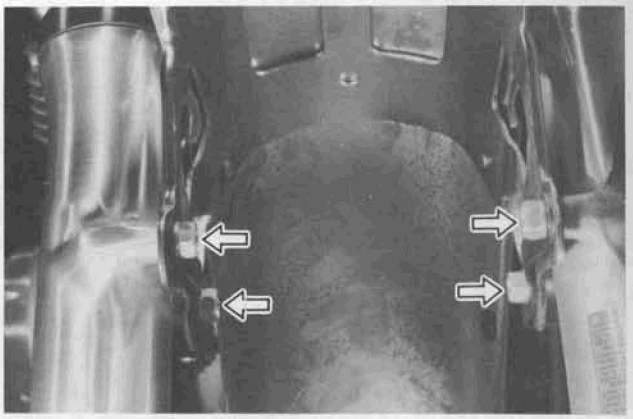
- Pull off cotter pin ① and remove axle nut ② .
- Loosen axle pinch bolt ③ .



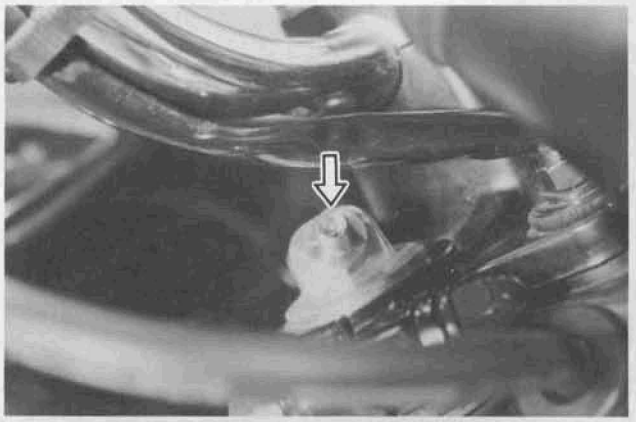
- Draw out axle shaft and take off front wheel.



- Remove four bolts and front fender.

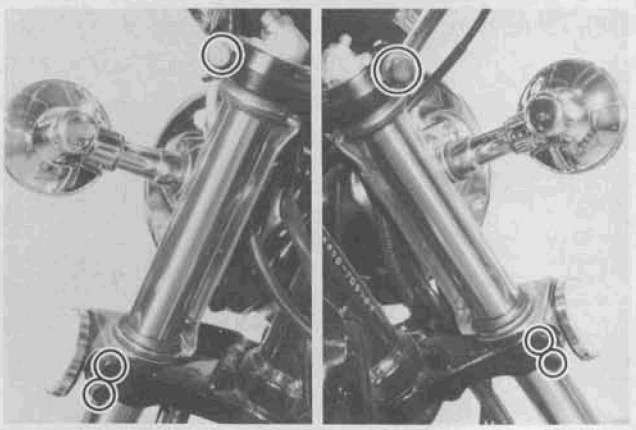


- Remove valve cap and push in the air valve to relieve the air pressure completely.

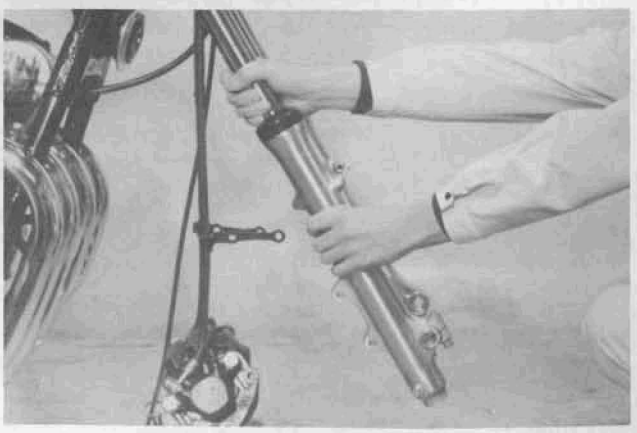


- Loosen the steering stem upper and lower clamp bolts.

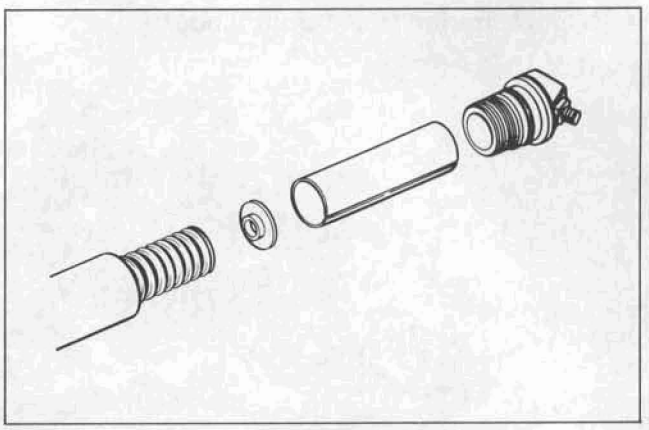
NOTE:
Slightly loosen the front fork cap bolt to facilitate later disassembly after loosening upper clamp bolt.



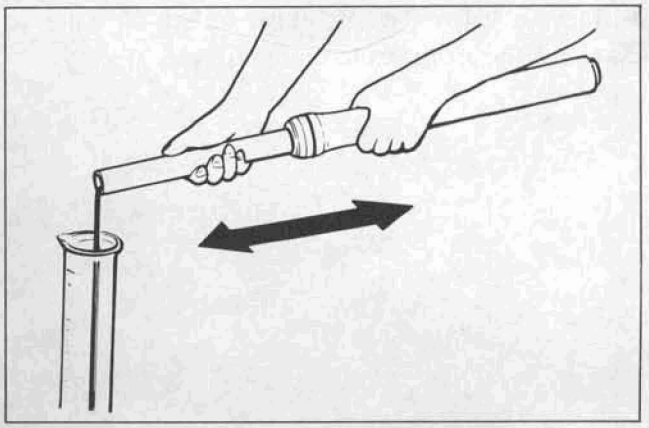
- Pull down right and left front fork assemblies.



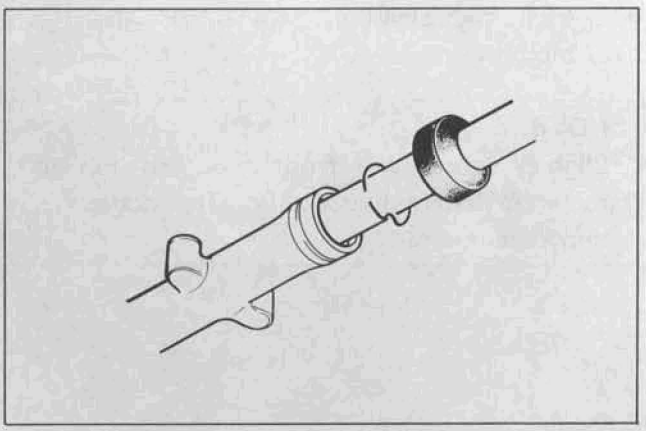
- Remove front fork cap bolt and draw out spacer, spring guide and spring.



- Invert the fork and stroke it several times to remove the oil inside.
  Under the condition (inverted condition), hold the fork for a few minutes.

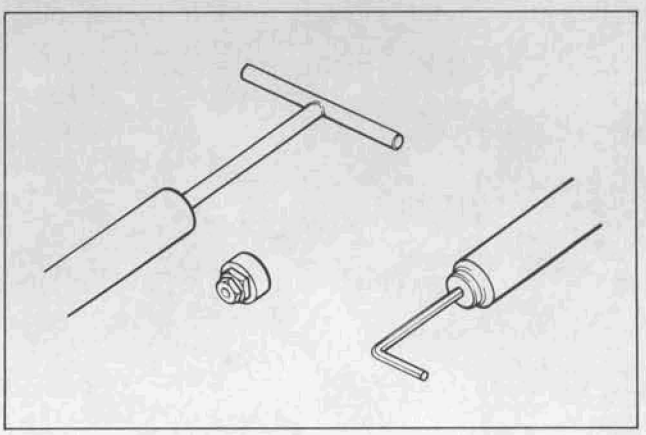


- Draw out dust seal and snap ring.

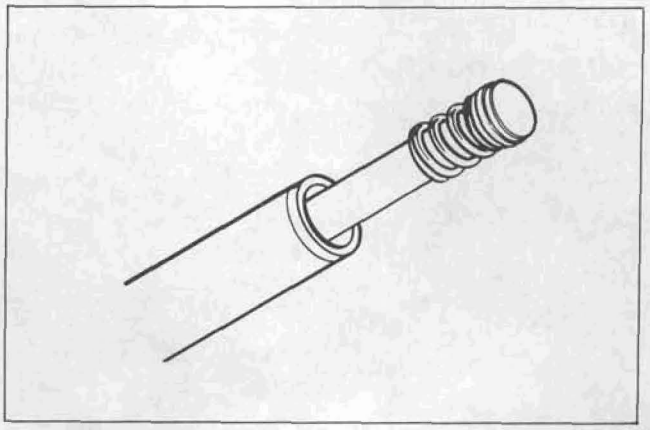


- Remove damper rod securing bolt by using special tools.

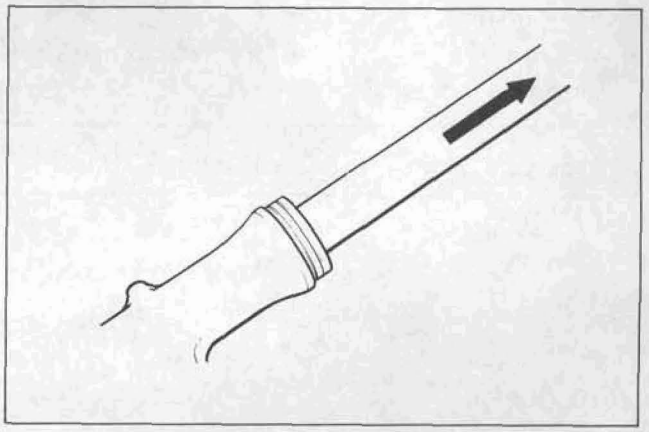
09940-34520	"T" handle
09940-34580	Attachment "F"



- Draw out damper rod and rebound spring.

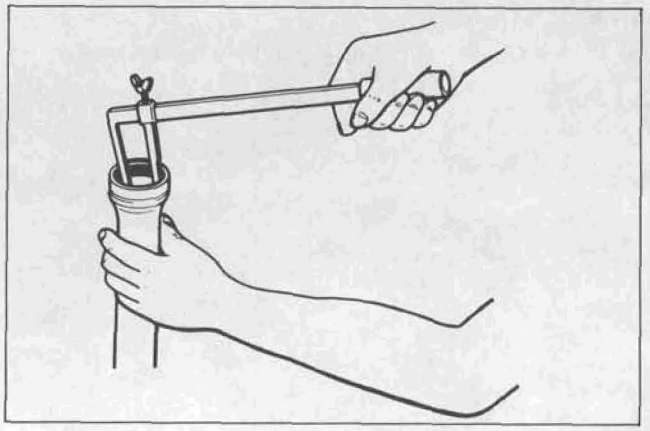


- Pull out inner tube.

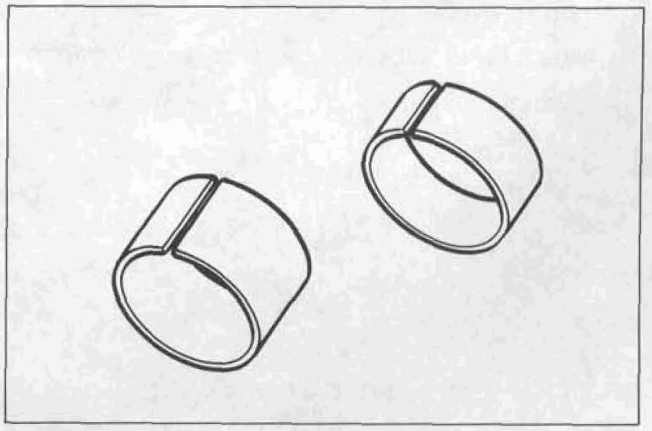


- Remove the oil seal by using special tool.

09913-50121	Oil seal remover



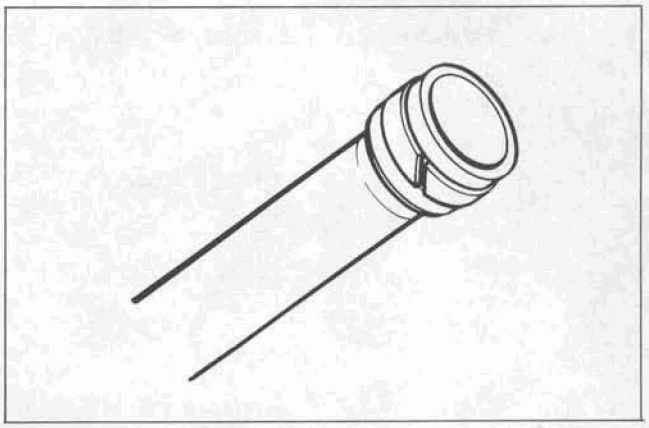
CAUTION:
The removed outer tube metal, inner tube metal and oil seal should be replaced.



INSPECTION

DAMPER ROD RING

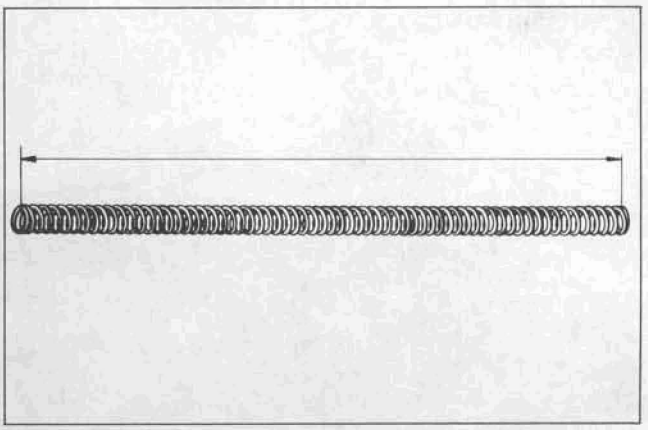
- Inspect damper rod ring for wear and damage.



FORK SPRING

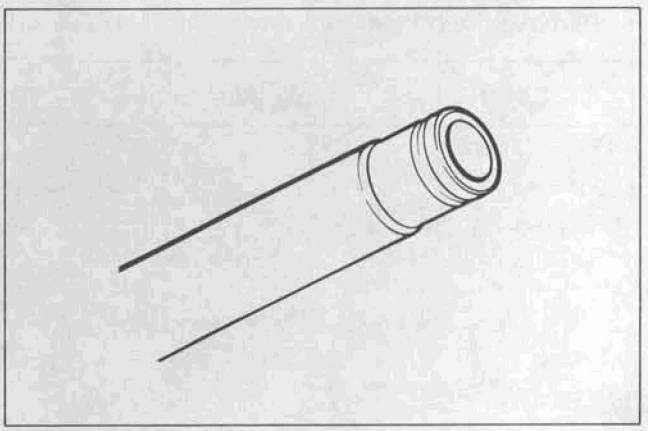
- Measure the fork spring free length. If it is shorter than service limit, replace it.

Service Limit	516 mm (20.3 in)



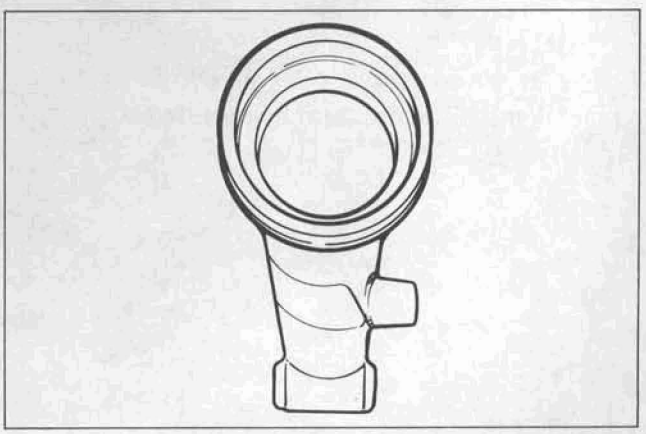
INNER TUBE

- Inspect inner tube outer surface for any scuffing.



OUTER TUBE

- Inspect outer tube inner surface for any scuffing.

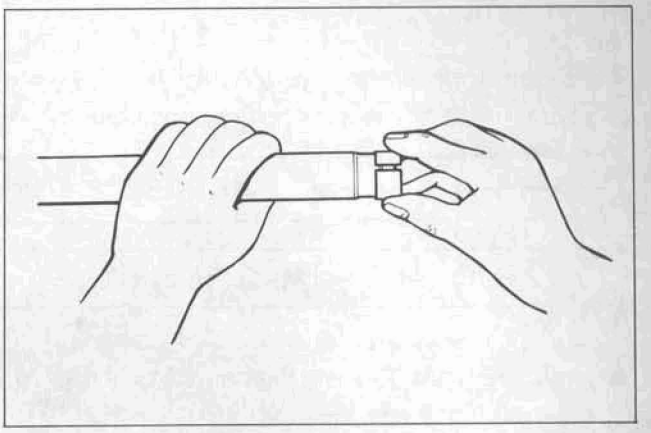


REASSEMBLY

- Reassemble and remount the front fork in the reverse order of disassembly and removal, and also carry out the following steps.

INNER TUBE METAL

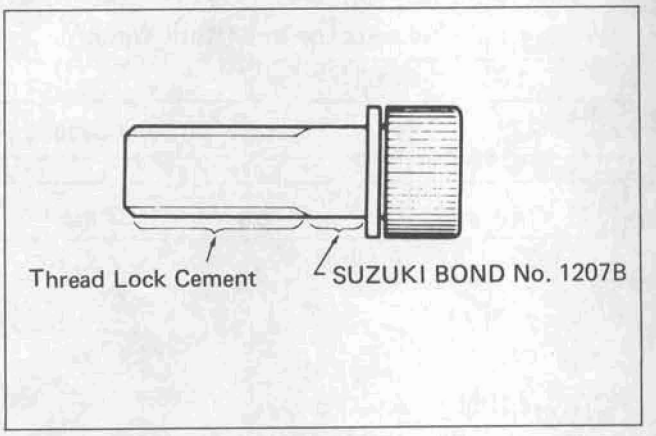
- Install the metal by hand as shown.



CAUTION:
Use special care to prevent damage to the Teflon coated surface of the anti-friction metal when mounting it.

DAMPER ROD BOLT

- Apply Suzuki Bond No. 1207B ① and Thread Lock Cement ② to the damper rod bolt and tighten with specified torque.



99104-31140	Suzuki Bond No. 1207B

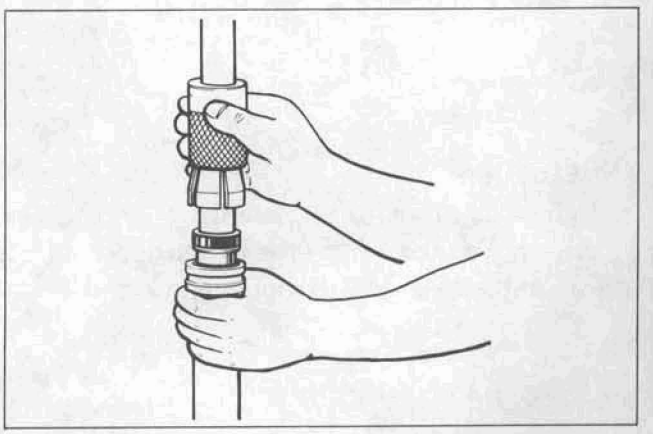
99000 - 32040	Thread Lock Cement

09940-34520	"T" handle
09940-34580	Attachment "F"

Tightening torque	2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft)

OUTER TUBE METAL AND OIL SEAL

- Mounting outer tube metal and oil seal by uisng special tool as shown.



CAUTION:
Use special care to prevent damage to the Teflon coated surface of the anti-friction metal when mounting it.

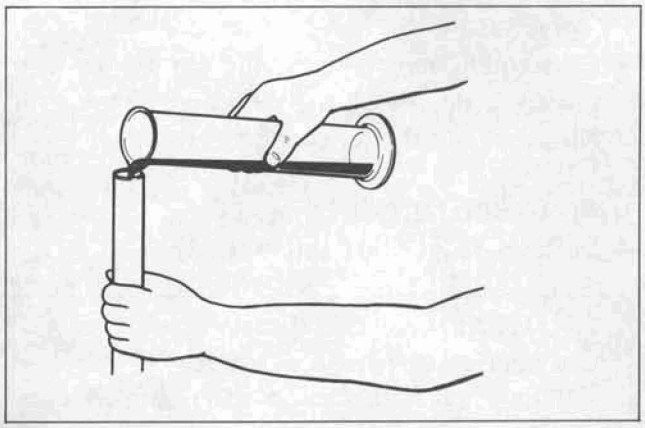
09940 - 50111	Front fork oil seal installer

FORK OIL

- For the fork oil, be sure to use a fork oil whose viscocity rating meets specifications below.

Fork oil	SAE # 15

Capacity	245 ml (8.27 US oz)

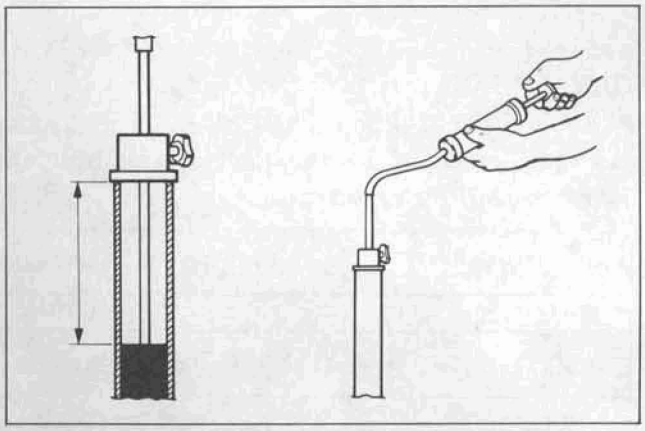


- Hold the front fork vertical and adjust the fork oil level with a special tool.

NOTE:
When adjusting oil level, remove the fork spring and compress the inner tube fully.

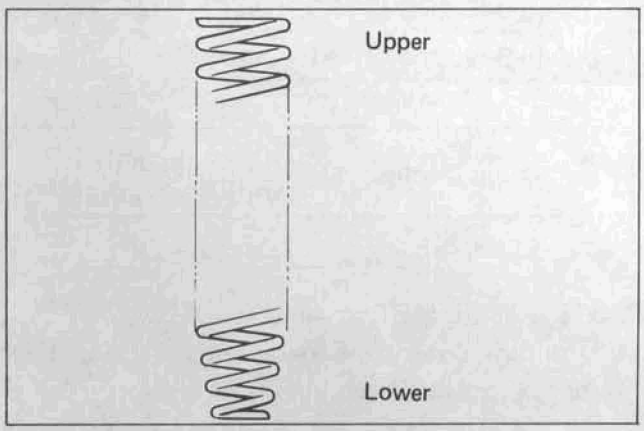
09943 - 74111	Fork oil level gauge

Oil level	260 mm (10.2 in)



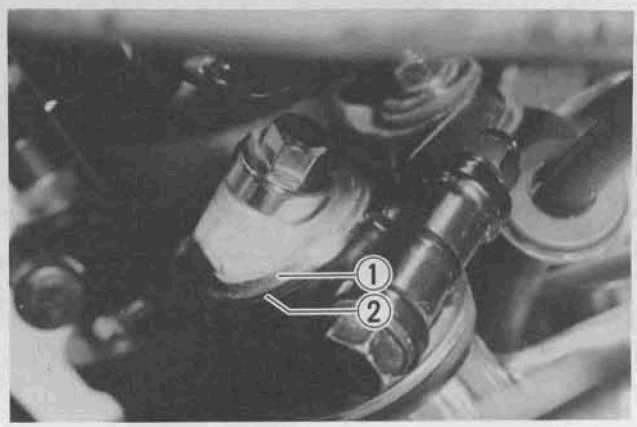
FORK SPRING

- When installing the fork spring as shown in Fig.



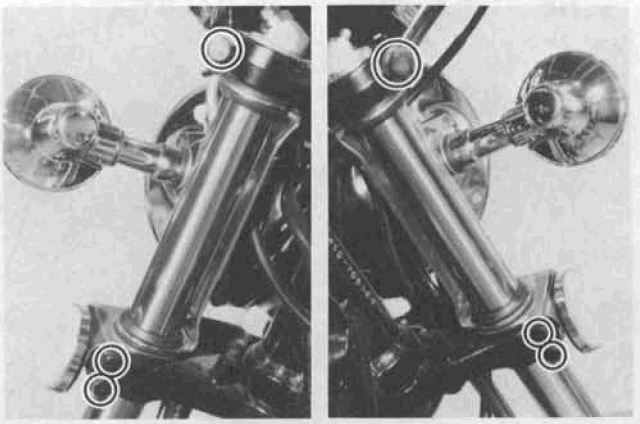
INNER TUBE

- Install the front fork assembly, align engraved line ① on the inner tube to the upper surface ② of the steering stem upper bracket.



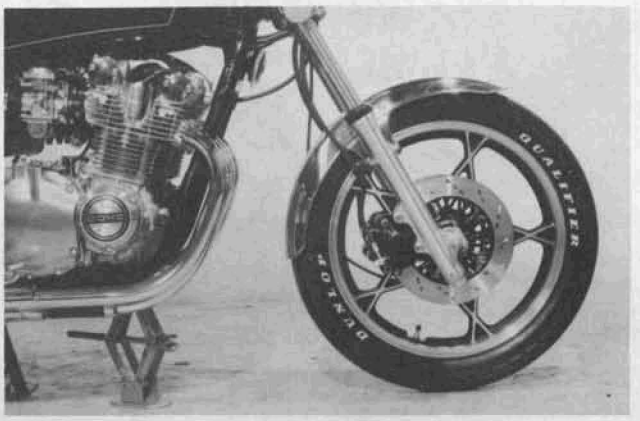
- Tighten the upper and lower clamp bolts.

Tightening torque (Upper)	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft)
(Lower)	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)

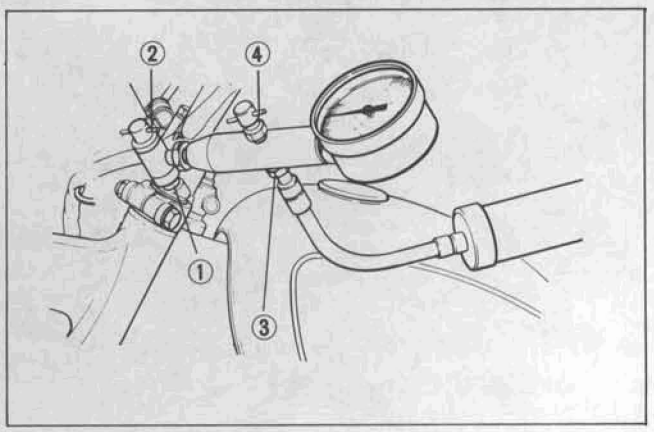


FORK AIR

- Lift up the front wheel by jack.



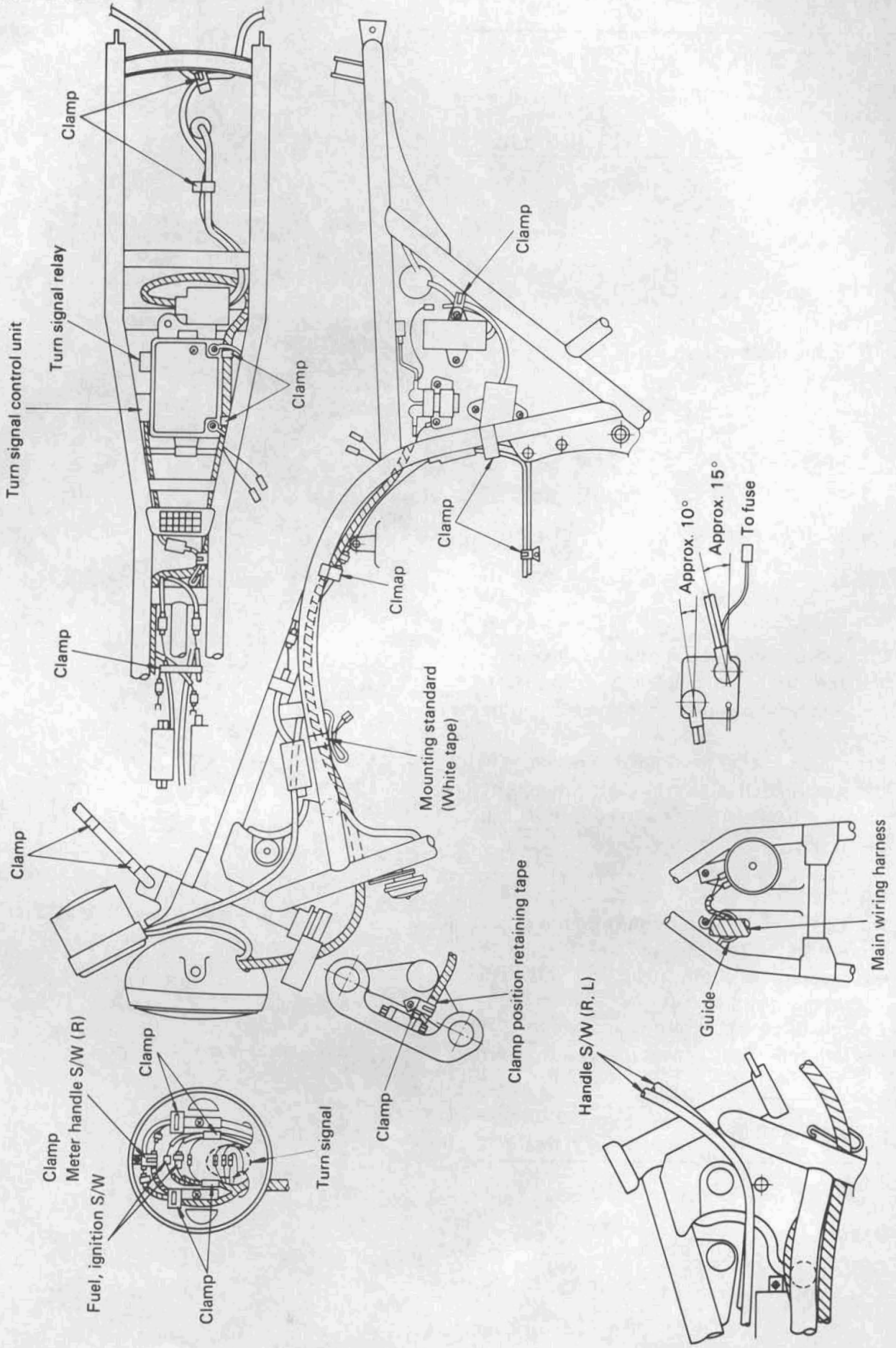
- Connect the air pressure gauge to the valve ① , and turn the valve handle ② clockwise. Connect the hand pump to the valve ③ , turn the valve handle ④ clockwise, and pump the air. Let the air out by loosening the handle ④ till the specified air pressure is left inside. Loosen the valve handle ② , and remove the air pressure gauge.

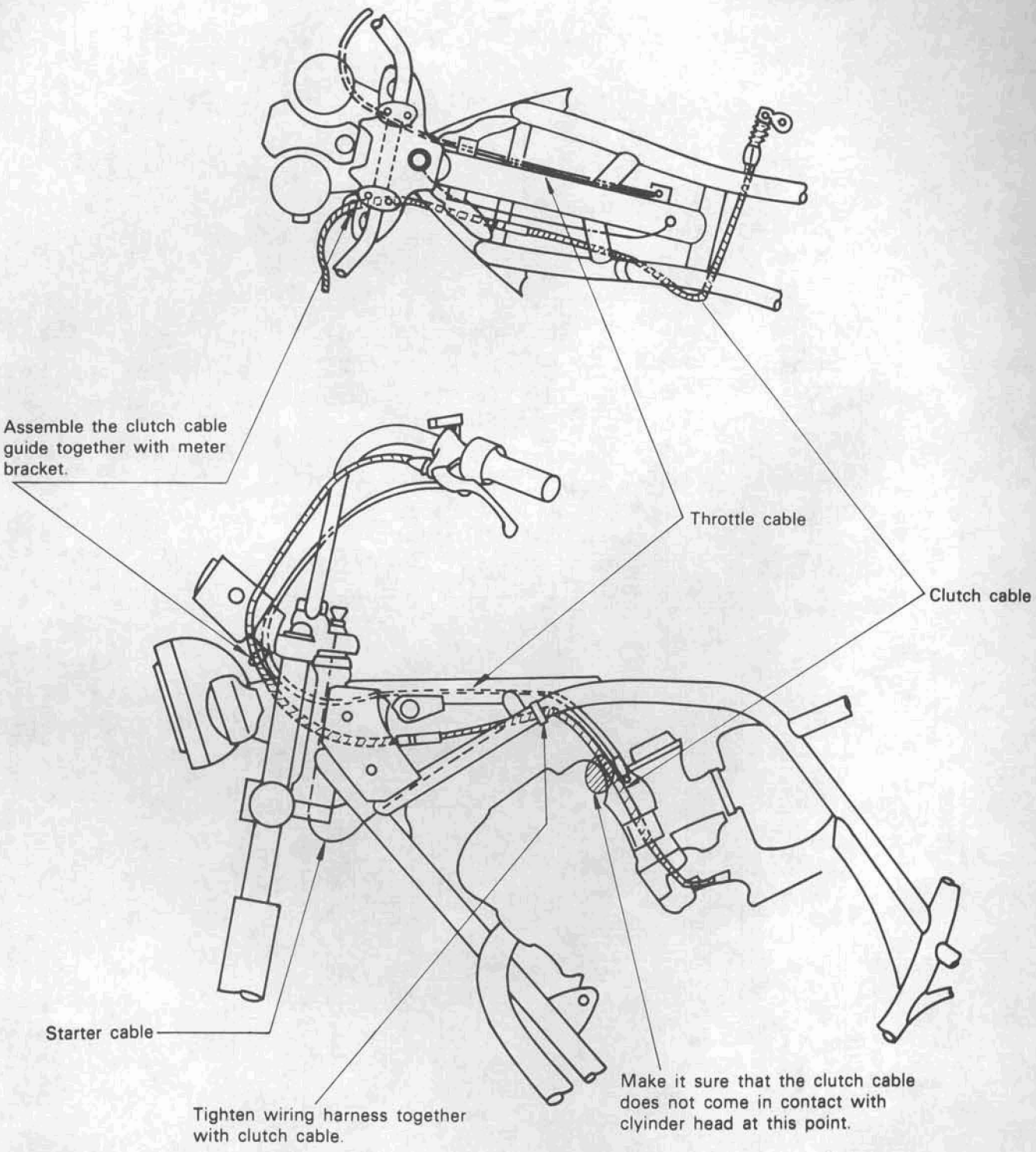


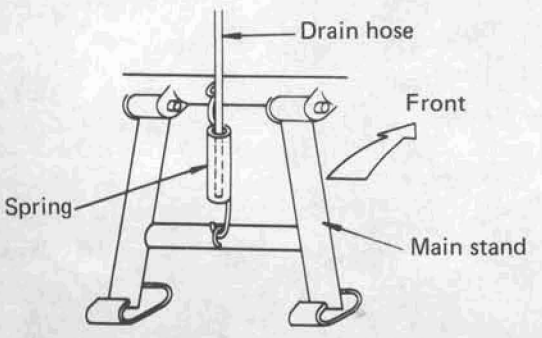
CAUTION:
During the air filling procedure do not exceed more than 2.50 kg/cm² (35 psi). Balance the air pressure of both right and left forks within specification.
Do not use a high pressure air source to fill the fork tube. Seal damage may result.

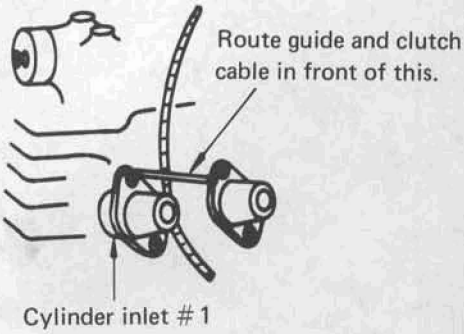
STD Air pressure	0.8 kg/cm² (11.4 psi)

WIRE AND CABLE ROUTING

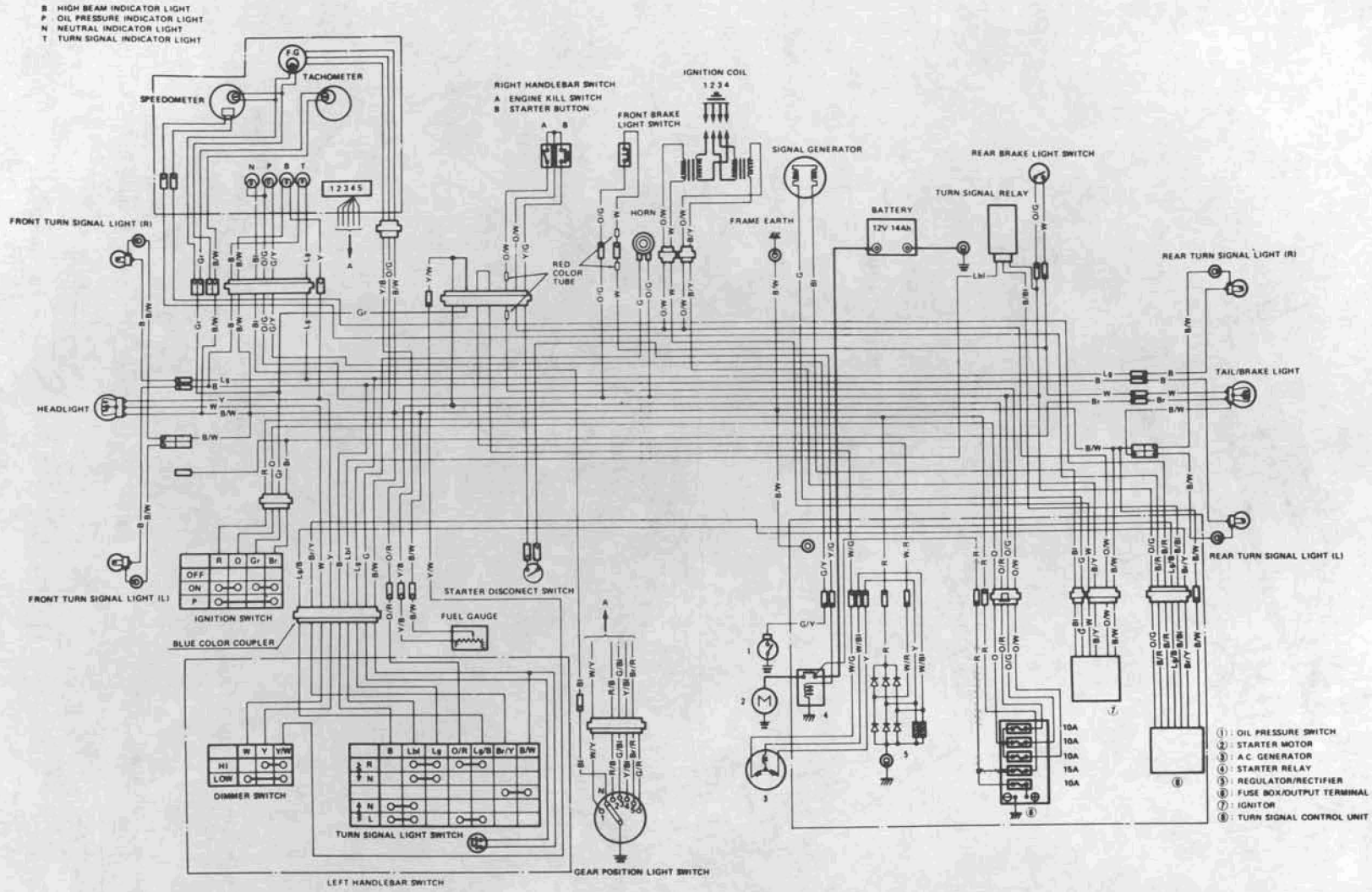

Clamp
Turn signal relay
Turn signal control unit
Clamp
Clamp
Clamp


Assemble the clutch cable guide together with meter bracket.
Throttle cable
Clutch cable
Starter cable
Tighten wiring harness together with clutch cable.
Make it sure that the clutch cable does not come in contact with clyinder head at this point.


Drain hose
Front
Spring
Main stand


Route guide and clutch cable in front of this.
Cylinder inlet # 1

WIRING DIAGRAM



WIRE COLOR

B . . . . . Black	R . . . . . Red	Br/R . . . Brown with Red tracer	G/W . . . Grren with White tracer	W/G . . . White with Green tracer
Bl . . . . . Blue	W . . . . . White	Br/W . . . Brown with White tracer	G/Y . . . Green with Yellow tracer	W/R . . . White with Red tracer
Br . . . . . Brown	Y . . . . . Yellow	Br/Y . . . Brown with Yellow tracer	O/R . . . Orange with Red tracer	W/Y . . . White with Yellow tracer
G . . . . . Green	B/Bl . . . Black with Blue tracer	G/B . . . Green with Black tracer	O/W . . . Orange with White tracer	Y/B . . . Yellow with Black tracer
Gr . . . . Gray	B/R . . . Black with Red tracer	Gr/B . . . Gray with Black tracer	R/B . . . Red with Black tracer	Y/Bl . . . Yellow with Blue tracer
Lbl . . . . Light blue	B/W . . . Black with White tracer	Lg/B . . . Light green with Black tracer	R/Bl . . . Red with Blue tracer	Y/G . . . Yellow with Green tracer
Lg . . . . Light green	B/Y . . . Black with Yellow tracer	Lg/R . . . Light green with Red tracer	R/G . . . Red with Green tracer	Y/R . . . Yellow with Red tracer
O . . . . . Orange	Bl/R . . . Blue with Red tracer	O/G . . . Orange with Green tracer	R/Y . . . Red with Yellow tracer	Y/W . . . Yellow with White tracer
P . . . . . Pink	Bl/W . . . Blue with White tracer	G/Bl . . . Green with Blue tracer	W/B . . . White with Black tracer	
	Bl/Y . . . Blue with Yellow tracer	G/R . . . Green with Red tracer	W/Bl . . . White with Blue tracer	

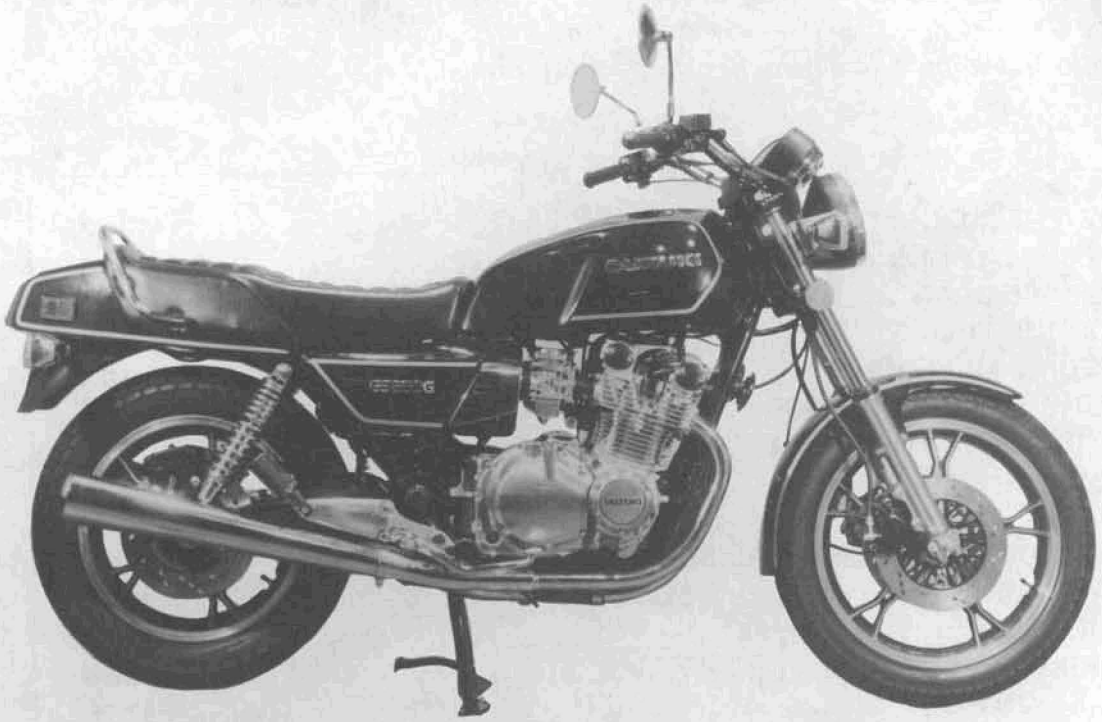
GS850GZ

This section gives service data and servicing procedures which deffer those of the GS850GX and describes the new features of the GS850GZ. Refer to the sections 1 through 16 except for the items described in this section.

CONTENTS

VIEW OF SUZUKI GS850GZ 17- 2
SPECIFICATIONS 17- 3
SERVICE DATA 17- 5
TORQUE TABLE 17-15
SPECIAL MATERIALS 17-18
PERIODIC MAINTENANCE 17-20
EMISSION CONTROL & REGULATIONS 17-21
COVER TIGHTENING BOLT 17-25
OIL JET 17-25
CYLINDER HEAD AND HEAD COVER 17-26
CAM TIMING 17-26
FUEL COCK 17-27
CHOKE LEVER 17-28
IGNITION SYSTEM 17-29
FRONT MASTER CYLINDER 17-31
WIRE AND CABLE ROUTING 17-35
WIRING DIAGRAM 17-37

VIEW OF SUZUKI GS850GZ



Right side

Left side

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	*2 195 mm (86.4 in)
Overall width	865 mm (34.1 in)
Overall height	1 190 mm (46.9 in)
Wheelbase	1 500 mm (59.1 in)
Ground clearance	*170 mm (6.7 in)
Seat height	*795 mm (31.3 in)
Dry mass	*245 kg (540 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm^3 (51.4 cu. in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS32SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

* Asterisk indicates new Z model specifications.

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	*62° 10′
Trail	113 mm (4.45 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	*3.50H19 4PR (Tubeless tire)
Rear tire size	*4.50H17 4PR (Tubeless tire)
Front tire pressure	1.75 kg/cm² (24 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve	22 L (5.8 US gal)
reserve	4.2 L (4.4 US qt)
Engine oil change	*3.0 L (3.2 US qt)
filter change	3.6 L (3.8 US qt)
overhaul	3.8 L (4.0 US qt)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure	0.6 kg/cm² (8.5 psi)
Front fork oil	*255 ml (8.62 US oz) in each leg

Specifications subject to change without notice.

* Asterisk indicates new Z model specifications.

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	36.0 (1.42)	—
	EX.	30.0 (1.18)	—
Valve lift	IN.	8.0 (0.31)	—
	EX.	7.5 (0.30)	—
Valve clearance or Tappet clearance (when cold)	IN.& EX.	0.03 – 0.08 (0.001 – 0.003)	—
Valve guide to Valve stem clearance	IN.	0.025 – 0.055 (0.0009 – 0.0022)	0.35 (0.014)
	EX.	0.040 – 0.070 (0.0016 – 0.0028)	0.35 (0.014)
Valve guide I.D.	IN.& EX.	7.000 – 7.015 (0.2756 – 0.2762)	—
Valve stem O.D.	IN.	6.960 – 6.975 (0.2740 – 0.2746)	—
	EX.	6.945 – 6.960 (0.2734 – 0.2740)	—
Valve stem runout	IN.& EX.	—	0.05 (0.002)
Valve head thickness	IN.& EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0 – 1.2 (0.04 – 0.05)	—
Valve head radial runout	IN.& EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	33.9 (1.33)
	OUTER	—	41.3 (1.63)
Valve spring tension (IN. & EX.)	INNER	29.3 – 34.0 kg (64.59 – 74.96 lbs) at length 23 (0.91)	—
	OUTER	50.4 – 58.3 kg (111.11 – 128.53 lbs) at length 27 (1.06)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.320 – 36.360 (1.4299 – 1.4315)	36.020 (1.4181)
	EX.	35.770 – 35.810 (1.4083 – 1.4098)	35.470 (1.3965)
Camshaft journal oil clearance	IN. & EX.	0.037 – 0.065 (0.0015 – 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012 – 22.025 (0.8666 – 0.8671)	———
Camshaft journal O.D.	IN. & EX.	21.960 – 21.975 (0.8646 – 0.8652)	———
Camshaft runout	IN. & EX.	———	0.1 (0.004)
Cam chain 20 pitch length		———	157.80 (6.213)
Cam chain pin (at arrow "3")		20 th pin	———
Cylinder head distortion		———	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	9 – 12 kg/cm² (128 – 171 psi)			7 kg/cm² (100 psi)
Compression pressure difference	———			2 kg/cm² (28 psi)
Piston to Cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)			0.120 (0.0047)
Cylinder bore	69.000 – 69.015 (2.7165 – 2.7171)			69.080 (2.7197)
Piston diam.	68.945 – 68.960 (2.7144 – 2.7150) Measure at the 15mm (0.59in) from piston skirt end.			68.880 (2.7118)
Cylinder distortion	———			0.2 (0.008)
Piston ring free end gap	1st	N	Approx. 9.0 (0.35)	7.2 (0.28)
	2nd	N	Approx. 9.5 (0.37)	7.6 (0.30)
Piston ring end gap	1st		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
	2nd		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
Piston ring groove clearance	1st		———	0.18 (0.0071)
	2nd		———	0.15 (0.0059)
Piston ring groove width	1st		1.21 – 1.23 (0.047 – 0.048)	———
	2nd		1.21 – 1.23 (0.047 – 0.048)	———
	Oil		2.51 – 2.53 (0.099 – 0.100)	———
Piston ring thickness	1st		1.175 – 1.190 (0.0463 – 0.0469)	———
	2nd		1.170 – 1.190 (0.0461 – 0.0469)	———
Piston pin bore I.D.	16.002 – 16.008 (0.6300 – 0.6302)			16.030 (0.6311)
Piston pin O.D.	15.995 – 16.000 (0.6297 – 0.6300)			15.980 (0.6291)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.006 – 16.014 (0.6302 – 0.6305)	16.040 (0.6315)
Conrod deflection	———	3.0 (0.12)
Conrod big end side clearance	0.10 – 0.65 (0.004 – 0.026)	1.0 (0.039)
Crankshaft runout	———	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	———
Oil pressure (at 60° C, 140° F)	Above 0.1 kg/cm² (1.4 psi) Below 0.25 kg/cm² (3.6 psi) at 3 000 r/min	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2 – 3 (0.08 – 0.12)	———
Drive plate thickness	2.7 – 2.9 (0.106 – 0.114)	2.4 (0.094)
Drive plate claw width	11.8 – 12.0 (0.46 – 0.47)	11.0 (0.43)
Driven plate thickness	2.0 ± 0.06 (0.08 ± 0.002)	———
Driven plate distortion	———	0.1 (0.004)
Clutch spring free length	———	38.5 (1.52)

TRANSMISSION

Unit: mm (in)

ITEM	STANDARD		LIMIT
Primary reduction	1.775 (87 / 49)		—
Secondary reduction	1.062 (17 / 16)		—
Final reduction	3.090 (34 / 11)		—
Gear ratios	Low	2.500 (35 / 14)	—
	2nd	1.777 (32 / 18)	—
	3rd	1.380 (29 / 21)	—
	4th	1.125 (27 / 24)	—
	Top	0.961 (25 / 26)	—
Shift fork to Groove clearance	0.4 – 0.6 (0.016 – 0.024)		0.8 (0.031)
Shift fork groove width	5.45 – 5.55 (0.215 – 0.219)		—
Shift fork thickness	4.95 – 5.05 (0.195 – 0.199)		—

SHAFT DRIVE

Unit: mm (in)

ITEM	STANDARD	LIMIT
Secondary bevel gear backlash	0.08 – 0.13 (0.003 – 0.005)	—
Final bevel gear backlash	0.03 – 0.64 (0.001 – 0.025)	—
Secondary drive bevel gear preload	3 – 5 kg·cm (2.60 – 4.35 lb·in)	—
Secondary driven bevel gear preload	4 – 7 kg·cm (3.45 – 6.05 lb·in)	—
Final drive bevel gear preload	4 – 8 kg·cm (3.45 – 6.95 lb·in)	—

CARBURETOR

Unit: mm (in)

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS32SS
Bore size		32 (1.26)
I. D. No.		*45160
Idle r/min.		1 050 ± 100 r/min.
Fuel level		5.0 ± 0.5 (0.20 ± 0.02)
Float height		22.4 ± 1.0 (0.88 ± 0.04)
Main jet	(M. J.)	# 115
Main air jet	(M. A. J.)	1.7
Jet needle	(J. N.)	5D50
Needle jet	(N. J.)	X–5
Pilot jet	(P. J.)	# 40
By pass	(B. P.)	1.0, 0.8, 0.8
Pilot outlet	(P. O.)	0.7
Valve seat	(V. S.)	2.0
Starter jet	(G. S.)	# 32.5
Pilot screw	(P. S.)	PRE-SET
Pilot air jet	(P. A. J.)	*# 180
Throttle cable play		0.5 – 1.0 (0.02 – 0.04)
Choke cable play		0.5 – 1.0 (0.02 – 0.04)

* Asterisk indicates new Z model specifications.

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION	
Ignition timing	17° B. T. D. C. Below 1 500 ± 150 r/min. and 37° B. T. D. C. Above 2 350 ± 150 r/min.	
Firing order	1, 2, 4, 3	
Spark plug	Type	NGK : B8ES N. D. : W24ES-U
	Gap	0.6 – 0.8 (0.024 – 0.031)
Spark performance	Over 8 (0.3) at 1 atm.	
Signal coil resistance	Approx.	140 – 180 Ω Bl – Y, G – B
Ignition coil resistance	Primary	O/W – W O/W – B/Y Approx. 3 – 5 Ω
	Secondary	Plug Cap – Plug cap Approx. 30 – 40 kΩ
Generator No-Load voltage	More than 80 V (AC) at 5 000 r/min.	
Regulated voltage	14.0 – 15.5 V at 5 000 r/min.	
Starter motor	Brush length	Limit: 6 (0.24)
	Commutator under cut	Limit: 0.2 (0.008)
Starter relay resistance	3 – 4 Ω	
Battery	Type designation	YB14L – A2
	Capacity	12V 50.4kC (14Ah)/10HR
	Standard electrolyte S. G.	1.28 at 20°C (68°F)
Fuse size	Headlight	10A
	Turn signal	10A
	Ignition	10A
	Main	15A
	Output terminal	10A

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		20 (0.8)	—
Brake disc thickness	Front	5.0 ± 0.2 (0.2 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder cylinder bore	Front	15.870 – 15.913 (0.6248 – 0.6265)	—
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston diam.	Front	15.827 – 15.854 (0.6231 – 0.6242)	—
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	—
Brake caliper cylinder bore	Front	38.180 – 38.256 (1.5031 – 1.5061)	—
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	—
Brake caliper piston diam.	Front	38.098 – 38.148 (1.4999 – 1.5019)	—
	Rear	38.098 – 38.148 (1.4999 – 1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	*3.50H19 4PR (Tubeless tire)	—
	Rear	*4.50H17 4PR (Tubeless tire)	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

* Asterisk indicates new Z model specifications.

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	160 (6.30)	———
Front fork spring free length	———	416 (16.4)
Front fork oil level	140 (5.5)	———
Front fork air pressure	0.6 kg/cm^2 (8.5 psi)	———
Rear wheel travel	*110 (4.33)	———

FUEL + OIL + CAPACITY

ITEM	SPECIFICATION	
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve	22 L (5.8 US gal)	
reserve	4.2 L (4.4 US qt)	
Engine oil type	SAE 10W/40	
Engine oil capacity	Change	*3 000 ml (3.2 US qt)
	Filter change	3 600 ml (3.8 US qt)
	Overhaul	3 800 ml (4.0 US qt)
Front fork oil type	Fork oil # 15	
Front fork oil capacity (each leg)	*255 ml (8.62 US oz)	
Bevel gear oil type	Hypoid Gear oil SAE 90, API grade GL-5	
Bevel gear oil capacity	Secondary	340 – 400 ml (11.5 – 13.5 US oz)
	Final	280 – 330 ml (9.5 – 11.2 US oz)
Brake fluid type	DOT3 or DOT4	

* Asterisk indicates new Z model specifications.

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING				CONTINUOUS HIGH SPEED RIDING			
	SOLO RIDING		DUAL RIDING		SOLO RIDING		DUAL RIDING	
	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi
FRONT	1.75	24	1.75	24	2.00	28	2.00	28
REAR	2.00	28	2.25	32	2.25	32	2.80	40

WATTAGE

Unit: W (cp)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
License light		8
Turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
*Side stand check light		3.4

* Asterisk indicates new Z model specifications.

TORQUE TABLE

ENGINE

ITEM	kg-m	lb-ft
Cylinder head cover bolt	0.6 – 1.0	4.5 – 7.0
Cylinder head bolt	0.7 – 1.1	5.0 – 8.0
Cylinder head nut	3.5 – 4.0	25.5 – 29.0
Camshaft bearing cap bolt	0.8 – 1.2	6.0 – 8.5
Camshaft sprocket bolt	2.4 – 2.6	17.5 – 19.0
Cam chain idler bolt	0.6 – 1.0	4.5 – 7.0
Cam chain guide No. 2 bolt	0.4 – 0.7	3.0 – 5.0
Generator rotor bolt	6.0 – 7.0	43.5 – 50.5
Signal rotor bolt	2.5 – 3.5	18.0 – 25.5
Starter motor bolt	0.4 – 0.7	3.0 – 5.0
Starter clutch bolt	1.5 – 2.0	11.0 – 14.5
Clutch sleeve hub nut	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	1.1 – 1.3	8.0 – 9.5
Clutch release arm bolt	0.6 – 1.0	4.5 – 7.0
Oil strainer screw	0.6 – 1.0	4.5 – 7.0
Gear shifting cam stopper spring holder bolt	1.8 – 2.8	13.0 – 20.0
Gear shift arm stopper bolt	1.5 – 2.3	11.0 – 16.5
Crankcase bolt (6 mm)	0.6 – 1.0	4.5 – 7.0
Crankcase bolt (8 mm)	1.8 – 2.2	13.0 – 16.0
Engine mounting nut (10 mm)	2.5 – 4.5	18.0 – 32.5
Engine mounting nut (12 mm)	4.5 – 7.0	32.5 – 50.5
Exhaust pipe bolt	0.9 – 1.4	6.5 – 10.0
Muffler bolt	1.8 – 2.8	13.0 – 20.0
Gear shift lever bolt	1.3 – 2.3	9.5 – 16.5
Secondary drive gear nut	12.0 – 15.0	87.0 – 108.5
Secondary driven gear nut	9.0 – 11.0	65.0 – 79.5
Secondary drive housing bolt	2.0 – 2.6	14.5 – 19.0
Secondary driven housing bolt	2.0 – 2.6	14.5 – 19.0

CHASSIS

ITEM	kg-m	lb-ft
Handlebar clamp bolt	1.2 – 2.0	8.5 – 14.5
Steering stem upper clamp bolt	1.5 – 2.5	11.0 – 18.0
Front fork upper bracket bolt (R, L)	2.0 – 3.0	14.5 – 21.5
Front fork lower bracket bolt (R, L)	1.5 – 2.5	11.0 – 18.0
*Steering stem head bolt	2.0 – 3.0	14.5 – 21.5
Front fork axle holder nut	1.5 – 2.5	11.0 – 18.0
Front fork damper rod bolt	2.0 – 2.6	14.5 – 19.0
Front axle shaft nut	3.6 – 5.2	26.0 – 37.5
Swinging arm pivot bolt	0.35 – 0.45	2.5 – 3.0
Swinging arm pivot nut	11.0 – 13.0	79.5 – 94.0
Rear torque link nut	2.0 – 3.0	14.5 – 21.5
Rear axle nut	5.0 – 8.0	36.0 – 58.0
Rear shock absorber nut	2.0 – 3.0	14.5 – 21.5
Footrest bolt	2.7 – 4.3	19.5 – 31.0
Front brake caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Front and rear brake disc plate bolt	1.5 – 2.5	11.0 – 18.0
Front brake caliper axle bolt	1.5 – 2.0	11.0 – 14.5
Front brake master cylinder mounting bolt	0.5 – 0.8	3.5 – 6.0
Front and rear brake hose union bolt	1.3 – 1.8	9.5 – 13.0
Front and rear brake oil bleeder bolt	0.6 – 0.9	4.5 – 6.5
Rear brake caliper mounting bolt	2.0 – 3.0	14.5 – 21.5
Rear brake caliper axle bolt	2.5 – 3.5	18.0 – 25.5
Rear brake master cylinder mounting bolt	1.5 – 2.5	11.0 – 18.0
Final drive gear nut	9.0 – 11.0	65.0 – 79.5
Final drive gear housing nut	3.5 – 4.5	25.5 – 32.5
Propeller shaft bolt	3.0 – 4.0	21.5 – 29.0
Final gear bearing case bolt	2.0 – 2.6	14.5 – 19.0
Final gear case shock mount stud bolt	9.0 – 11.0	65.0 – 79.5
Final case oil filler plug	2.0 – 3.0	14.5 – 21.5

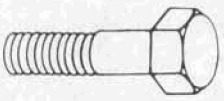
* Asterisk indicates new Z model specifications.

TIGHTENING TORQUE CHART

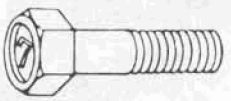
For other bolts and nuts not listed on previous pages, refer to this chart:

TIGHTENING TORQUE

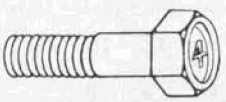
Thread Diameter (mm)	Conventional or "4" Marked Bolt		"7" Marked Bolt	
	kg-m	lb-ft	kg-m	lb-ft
4	0.1 – 0.2	0.7 – 1.5	0.15 – 0.3	1.0 – 2.0
5	0.2 – 0.4	1.5 – 3.0	0.3 – 0.6	2.0 – 4.5
6	0.4 – 0.7	3.0 – 5.0	0.8 – 1.2	6.0 – 8.5
8	1.0 – 1.6	7.0 – 11.5	1.8 – 2.8	13.0 – 20.0
10	2.2 – 3.5	16.0 – 25.5	4.0 – 6.0	29.0 – 43.5
12	3.5 – 5.5	25.5 – 40.0	7.0 – 10.0	50.5 – 72.5
14	5.0 – 8.0	36.0 – 58.0	11.0 – 16.0	79.5 – 115.5
16	8.0 – 13.0	58.0 – 94.0	17.0 – 25.0	123.0 – 181.0
18	13.0 – 19.0	94.0 – 137.5	20.0 – 28.0	144.5 – 202.5



Conventional Bolt



"7" Marked Bolt

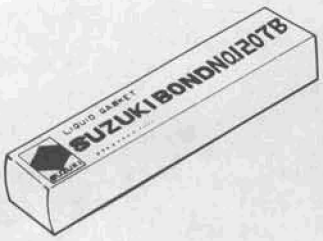
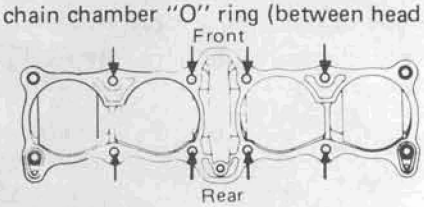
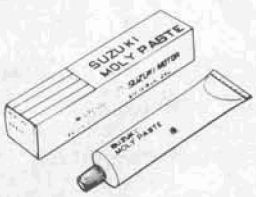


"4" Marked Bolt

SPECIAL MATERIALS

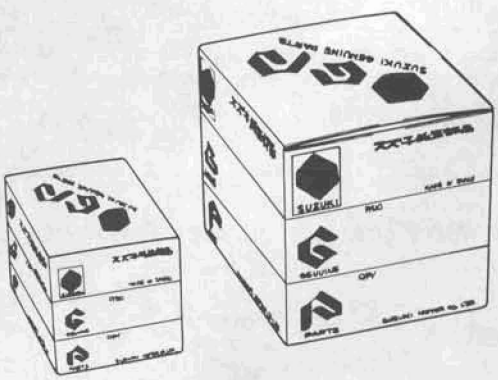
The materials listed below are needed for maintenance work on the GS850G, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

Material	Part
 99000-25030 SUZUKI SUPER GREASE "A"	* Oil seals * Throttle grip * Cables (Speedometer and tachometer) * Clutch release mechanism * Wheel bearings * Swinging arm bearing * Steering stem bearing
 99000-32040 THREAD LOCK CEMENT	* Oil filter cover nut . . . . . 3 pcs * Camshaft end cap screw . . . . . 8 pcs * Front fork damper rod bolt . . . . . 2 pcs * Carburetor adjuster bracket screw . . . . . 2 pcs * Carburetor plate screw . . . . . 8 pcs * Carburetor starter shaft screw . . . . . 4 pcs
 99000-32050 THREAD LOCK "1342"	* Gearshift cam guide screw . . . . . 2 pcs * Gearshift pawl screw . . . . . 2 pcs * Countershaft B/G retainer screw . . . . . 3 pcs * Driveshaft plate screw . . . . . 3 pcs * Generator stator screw . . . . . 3 pcs * Generator lead wire guide screw . . . . . 3 pcs * Engine oil pump screw . . . . . 4 pcs * Oil gallery plate screw . . . . . 3 pcs * Secondary drive bevel gear assy set bolt . . . . . 4 pcs * Secondary driven bevel gear assy set bolt . . . . . 4 pcs * Final bevel gear bearing holder screw . . . . . 3 pcs * Final bearing case bolt . . . . . 10 pcs
 99000-32020 THREAD LOCK SUPER "1333B"	* Thread portion of secondary driven gear * Thread portion of final drive gear * Propeller shaft joint bolt . . . . . 4 pcs * Stater clutch allen bolt . . . . . 3 pcs * Cam chain guide bolt . . . . . 3 pcs * Gearshift stopper . . . . . 1 pc

Material	Part
 99000-32030 THREAD LOCK SUPER "1303"	* Cam sprocket bolt. . . . . 4 pcs
 99104-31140 SUZUKI BOND No. 1207B	* Cylinder stud bolt . . . . . 8 pcs (Apply a small quantity to the threads of cylinder stud bolts.) Cam chain chamber "O" ring (between head and cylinder)  * Mating surfaces of uppèr and lower crankcase. * Final gear case * Joint portion of rear swinging arm and final gear case.
 99000-25100 SUZUKI SILICONE GREASE	* Apply to caliper axle shaft
 99000-25140 SUZUKI MOLY PASTE	* Valve stem * Camshaft journal * Chain tensioner adjuster shaft * Counter shaft washer * Outer counter shaft * Input cam dog

USE OF GENUINE SUZUKI PARTS

To replace any part of the machine, use a genuine SUZUKI replacement part. Imitation parts or parts supplied from any other source than SUZUKI, if used to replace SUZUKI parts can reduce the machine's performance and, even worse, could induce costly mechanical troubles.



PERIODIC MAINTENANCE

IMPORTANT: The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also enhance the reliability and performance of the motorcycle.

NOTE:
Vehicles operated under severe conditions may require more frequent servicing.

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and to maintain proper emission levels. Mileages are expressed in terms of kilometers, miles and time for your convenience.

PERIODIC MAINTENANCE SCHEDULE

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST						
	Mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		–	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		–	C	C	C	C
Tappet clearance		I	I	I	I	I
Spark plug		–	C	R	C	R
Fuel line		Replace every two years				
Engine oil and oil filter		R	R	R	R	R
Engine idle speed		I	I	I	I	I
Clutch		I	I	I	I	I
Secondary and Final gear oil		Change oil at initial 600 miles (1 000 km) every 7 500 miles (12 000 km)				
Brake hose		Replace every two years				
Brake		I	I	I	I	I
Tires		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front forks		–	–	I	–	I
		Check air pressure every 6 months.				

NOTE: T = Tighten, I = Inspect, R = Replace, C = Clean

EMISSION CONTROL & REGULATIONS

EMISSION REGULATIONS

On February 4, 1977, Federal Emission Regulations for motorcycles that may be licensable took effect. The regulations provided for a gradual, multi-step application of stricter emission limits beginning with all effected motorcycles manufactured after January 1, 1978, culminating with the present 1980 emission level restrictions. For the 1980 and succeeding years one set of emission limits will be in effect. They are as follows:

1980 EMISSION LIMITS

CATEGORIES	HYDROCARBONDS (HC)	CARBON MONOXIDE
All motorcycles 50 cc – Larger	5.0 Grams/Kilometer (8.0 Grams/Mile)	12 Grams/Kilometer (19.3 Grams/Mile)

Emission-controlled motorcycles which are subject to the emission regulations are those motorcycles which are equipped with a headlight, taillight, stoplight and which have an engine displacement larger than 50 cc.

Suzuki Motor Company performed all the necessary testing and certification of emission-controlled models in strict compliance with the E.P.A. testing regulations. Suzuki motorcycle dealers are not required to either test or certify emission levels on any motorcycles as Suzuki Motor Company is legally responsible for the entire certification procedure.

E.P.A. regulations also provide fines for individuals who alter, render inoperative or improperly service emission-controlled motorcycles ranging up to $10,000.00 per motorcycle. It is essential that the individual servicing this emission-controlled motorcycle review thoroughly all the service procedures presented in this manual. Under no circumstances should the recommended service procedures be deviated from nor adjustments made which are not in accordance with the factory specifications or service procedures.

EMISSION CONTROL CARBURETOR COMPONENTS

GS850G motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

There are several carburetor mixture control components in each carburetor assembly. Three (3) of these components are machined to much closer tolerances than standard machined carburetor jets. These three (3) particular jets – MAIN JET, NEEDLE JET, PILOT JET – must not be replaced by standard jets. To aid in identifying these three (3) jets a different design of letter and number are used. If replacement of these close tolerance jets becomes necessary, be sure to replace them with the same type close tolerance jets marked as in the examples shown below.

The jet needle is also of special manufacture. Only one clip position is provided on the jet needle. If replacement becomes necessary the jet needle may only be replaced with an equivalent performing replacement component. Suzuki recommends that Genuine Suzuki Parts be utilized whenever possible for the best possible performance and durability.

Conventional Figures Used on Standard Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0
Emission Type Figures Used On Close Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0

The carburetor specification for the emission-controlled GS850G are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
45160	#115	X-5	5D50	#40	PRE-SET DO NOT ADJUST

The pilot screw is pre-set by the factory utilizing specialized testing and adjusting procedures. The pilot screw is not adjustable as the idle circuit is "sealed" after factory adjustment. Adjusting, interferring with, improper replacement, or resetting of any of the carburetor components may adversely affect carburetor performance and cause the motorcycle to exceed the exhaust emission level limits. If persons, who are unaware of these special carburetor servicing requirements tamper with the carburetors the Suzuki dealer should restore the carburetors to their original condition or if unable to effect repairs, contact the distributors representative for further technical information and assistance.

GENERAL EMISSION INFORMATION

There are three different types of regulated exhaust emissions. They are:

Hydrocarbons (HC)
Carbon Monoxide (CO)
Oxides of Nitrogen (NOx)

Automobiles must meet specific emission standards for all three of these pollutants. Motorcycles must only meet the requirements for the following:

Hydrocarbons (HC)
Carbon Monoxide (CO)

HC exhaust emissions are basically unburned fuel vapors which have passed through the engine and escaped the combustion process.

CO exhaust emissions are formed during an incomplete combustion cycle as a result of a rich air/fuel mixture. The only way that CO can be produced is by the combustion cycle.

Total NOx emissions from all motorcycles is considered negligible. The EPA states that total NOx emission from motorcycles by 1990 will only amount to approximately 0.5%. NOx is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

Carbon monoxide is a product of an incomplete combustion cycle. CO is measured in grams per mile or kilometer and also in percentage (%)

The most common cause of CO is rich carburetion. As the mixture is richened excessively, the CO amount increases proportionately. Engine oil is also a hydrocarbon, so engine problems which lead to oil burning increase carbon monoxide.

CARBURETION MALFUNCTION

1. Air Cleaner – Dirty or over oiled.
2. Idle Mixture – Adjusted incorrectly.
3. Idle Speed – Too high or low.
4. Fuel Level – Sticking float, leaking needle, incorrect setting.
5. Choke – Leaking or linkage sticking.
6. Synchronization – Improper balance on multi cylinders.

ENGINE MALFUNCTIONS

1. Valve Seals – Leaking or torn.
2. Valve Guide – Worn and leaking excess oil.
3. Gaskets – Leaking oil into combustion chamber.

HYDROCARBONS

Hydrocarbons are unburned gasoline vapors and can be measured in two different ways. The first is to measure the weight of the pollutants over a specific distance such as grams per mile or grams per kilometer. The second method is to measure the concentration of HC in the exhaust gas in parts per million (PPM).

The most common cause of high HC emissions are ignition system problems. If the ignition system fails to ignite the fuel mixture properly, then raw gasoline vapors will pass through the engine into the exhaust system. Listed are the most common ignition problems which occur and which can affect HC emission output.

IGNITION SYSTEM MALFUNCTIONS

1. Spark Plugs – Fouled, dirty, improper type or improperly gapped.
2. Ignition timing – Advanced or Retarded.
3. Timing Advance – Too fast or too slow an advance rate.
4. Battery – Low charge or faulty.

Carburetion can also lead to high HC emissions if the mixture is either excessively rich or excessively lean.

MIXTURE-RELATED MALFUNCTIONS

1. Air Cleaner – Dirty, over oiled or torn.
2. Jets – Clogged, restricted or incorrect size.
3. Float Level – Level too low (lean) or too high (rich).
4. Choke – Leaking choke plunger or sticking linkage.
5. Air Leaks – Intake manifolds, engine gaskets and other sealing surfaces.
6. Synchronization – Unbalanced on multi-cylinder machines.
7. Exhaust System – Restricted flow or improper exhaust system.

Engine wear or damage can also cause high HC emissions.

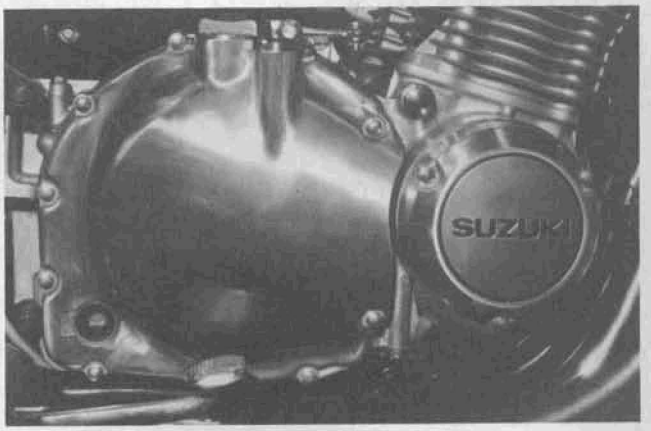
1. Rings – Low compression, leakage into crankcase.
2. Valves – Improper adjustment, bent stem or burnt.
3. Gaskets – Leaking, loss of compression.
4. Crank Seals – Leaking.
5. Oil Consumption – Worn valve guides, worn rings, clogged crankcase breather.
6. Oil – Improper engine oil.

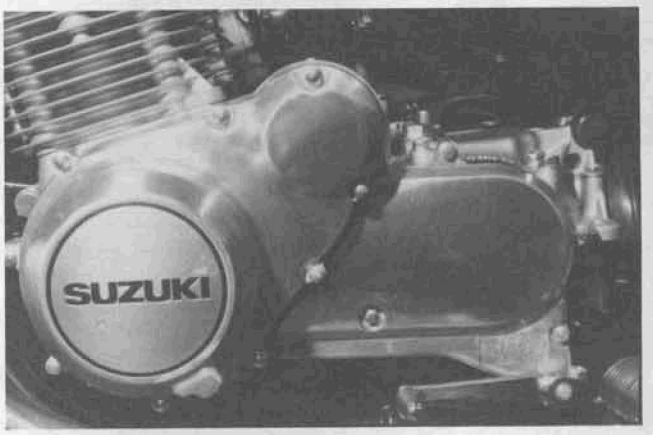
COVER TIGHTENING BOLTS

The engine case covers fasteners have been changed from screws to bolts.

- Clutch cover
- Signal generator cover
- Generator cover
- Secondary drive unit cover
- Starter motor cover

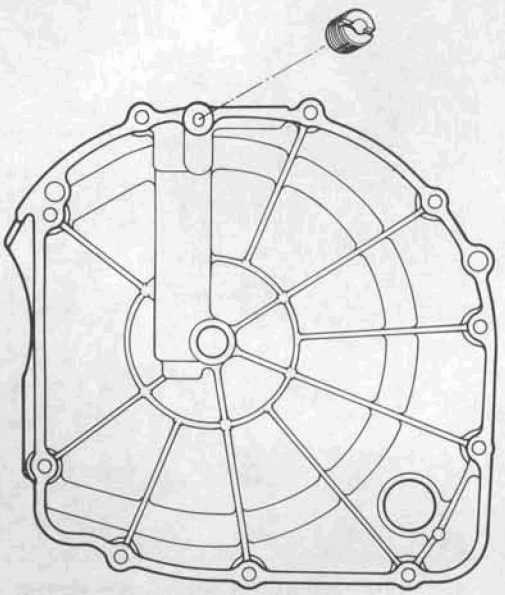
NOTE:
When unscrewing or tightening bolts use an allen wrench.





OIL JET

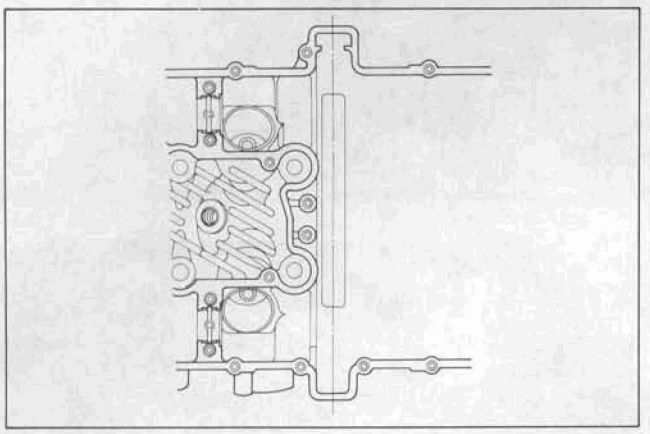
A #110 oil jet is added to the clutch cover as shown below.



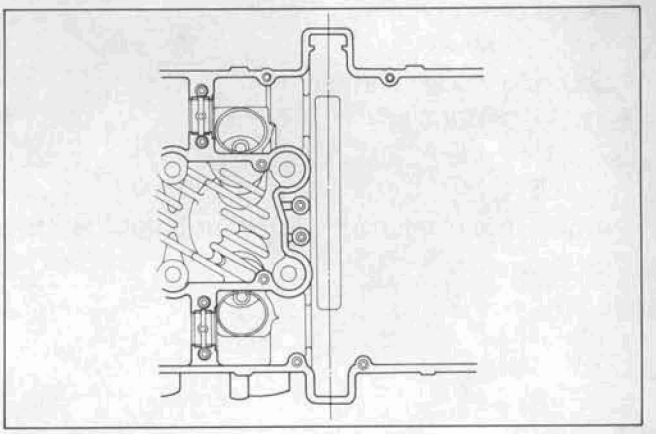
CYLINDER HEAD AND HEAD COVER

The cylinder head and head cover have been modified as illustrated below to improve sealing between cylinder head and head cover.

EFFECTIVE ENGINE NO. : GS850G-155015 ~

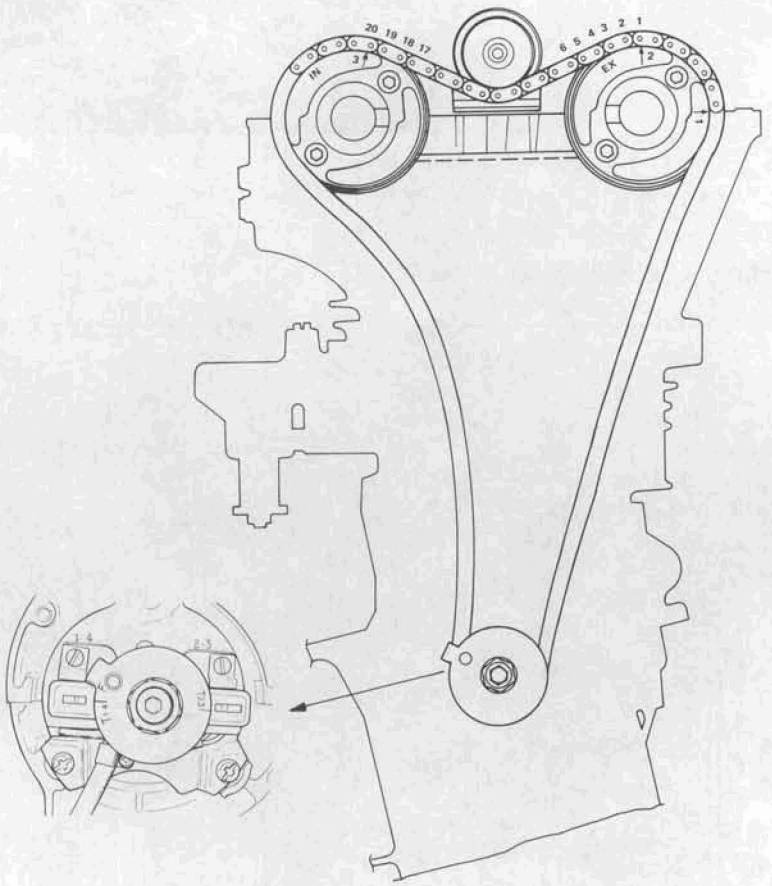


LATE



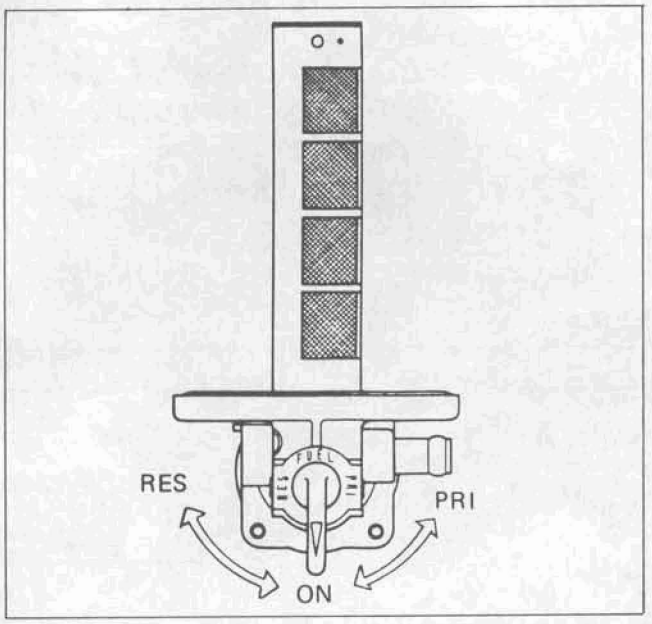
EARLY

CAM TIMING



Align the "T" mark (on Nos. 1 and 4 cylinder side of the rotor) to the center of pick up coil (Nos. 1 and 4 side).

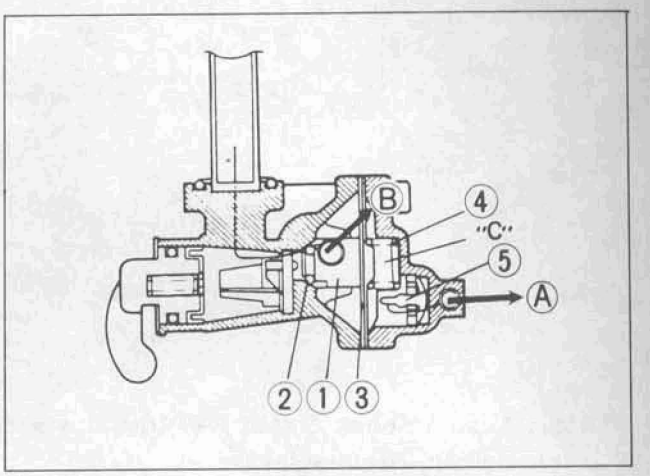
FUEL COCK



This fuel cock is provided three position, ON RES and PRI.

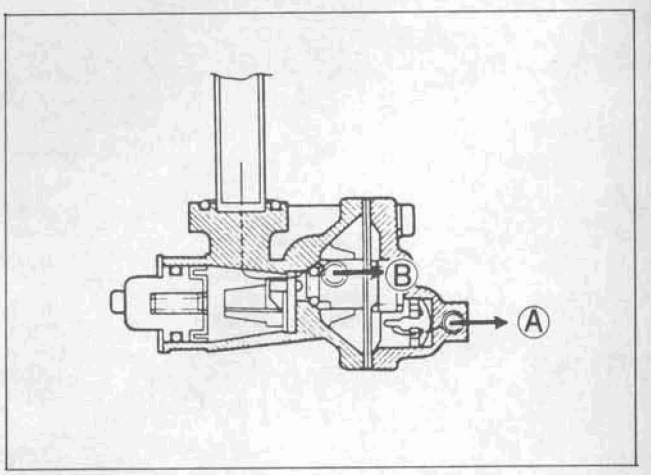
When the engine is not running and the lever is in the ON or RES position, the fuel valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is started, a negative pressure is generated in the diaphragm chamber "C" through the vacuum (negative pressure) pipe which is connected to the carburetors, and builds up a negative pressure which is stronger than the spring pressure so that the diaphragm is forced to open the fuel valve and thus allow the fuel to flow to the carburetors.

When the lever is set to PRI position, the protrusion ⑥ located on the lever end pushes back the fuel valve mechanically against the spring force and it allows fuel to flow to the carburetors directly, whether the engine is running or not through the RES side fuel filtre and fuel valve clearance.

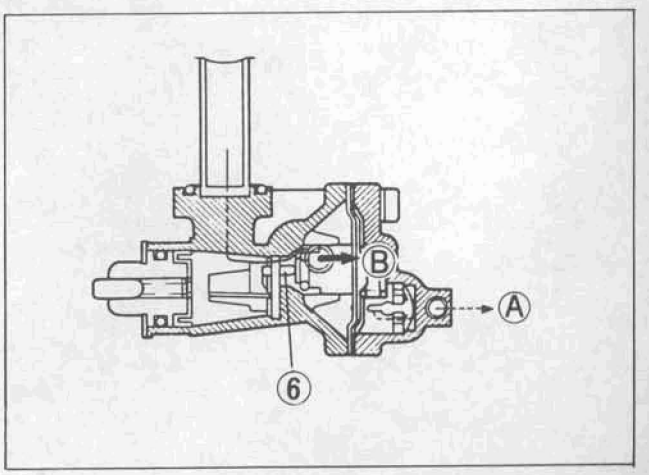


"ON"

① Fuel valve ② O-ring ③ Diaphragm
④ Spring ⑤ One way valve
Ⓐ Vaccum Ⓑ Fuel flow



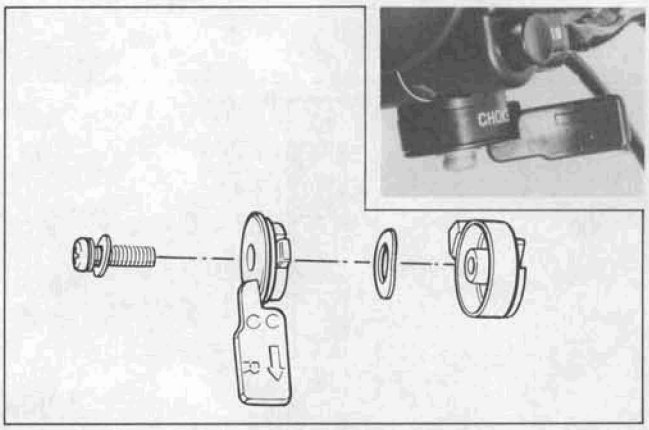
"RES"



"PRI"

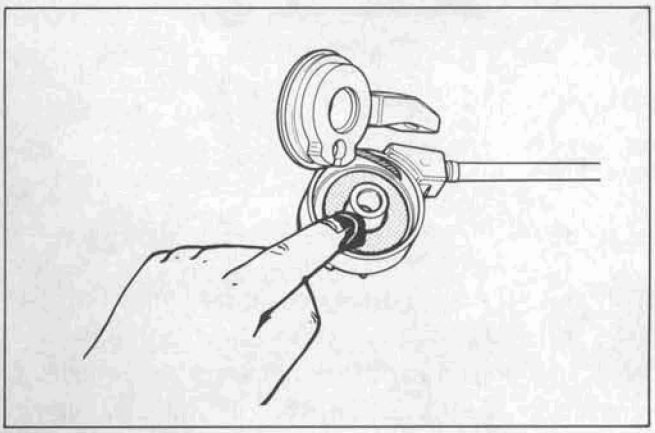
CHOKE LEVER

- Remove the choke lever and choke cable.



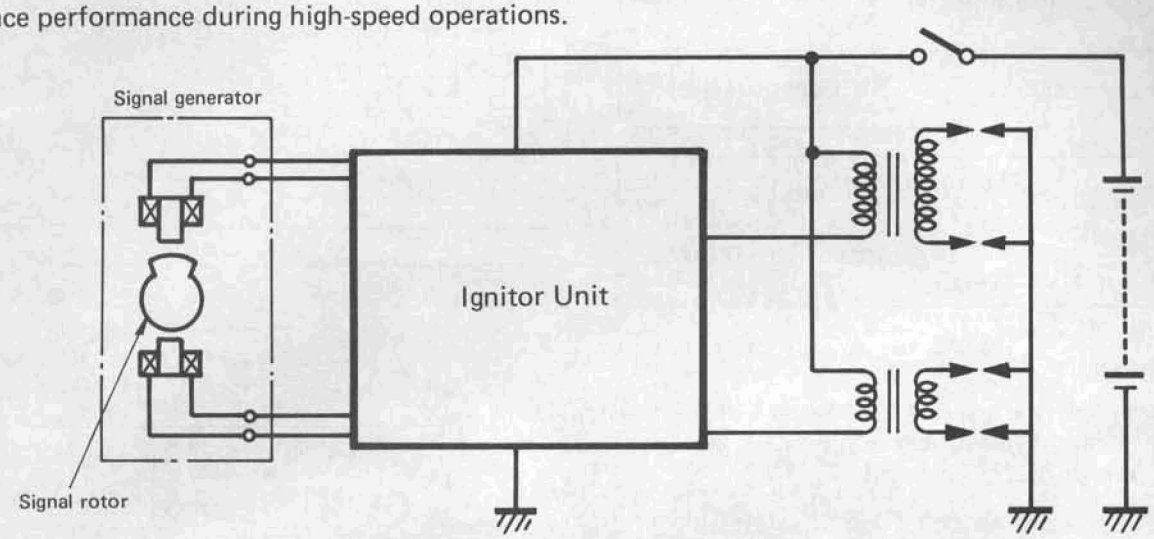
- Apply Suzuki Super Grease "A" to the washer before tighten the screw.

99000-25030	Suzuki Super Grease "A"

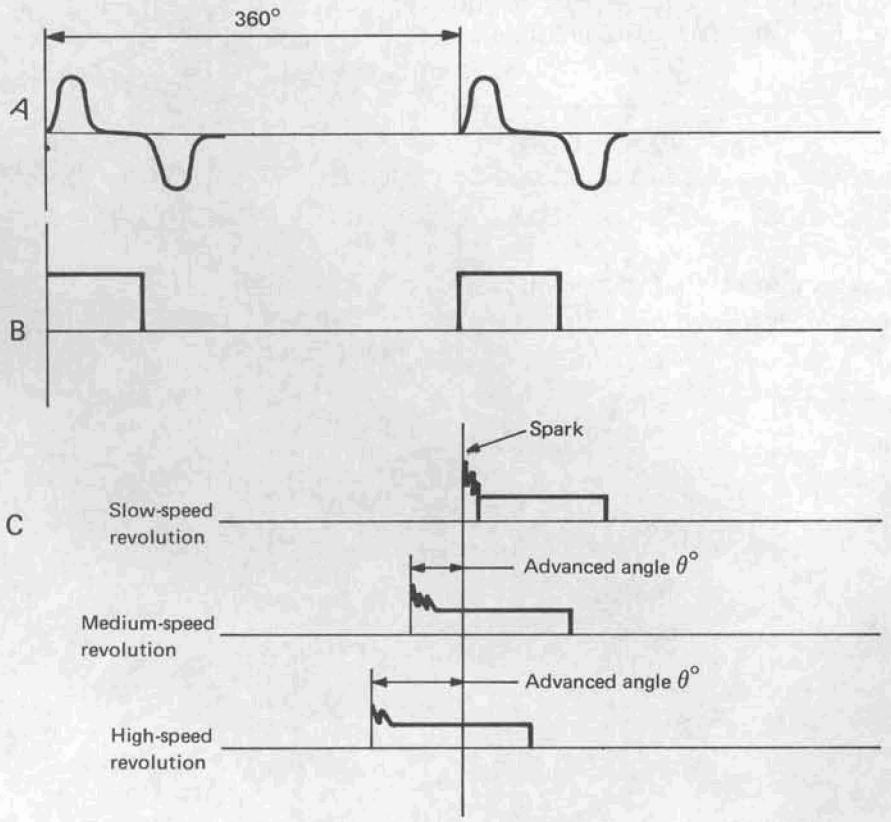


IGNITION SYSTEM

On the Model GS850GZ, the timing advance characteristics of the ignition timing have been changed from the hitherto-employed mechanical timing advance system incorporating an advance governor to an electronic timing advance system. The introduction of this new electronic timing advance system has kept the change in the ignition timing due to time lapse at a minimum level and also has improved the timing advance performance during high-speed operations.



When the signal rotor is rotated in the system block diagram above, the signal "A" is generated in the pick-up coil. The thus-generated signal will be converted to the signal waveform "B" at the inside of the ignitor unit. Based on this "B" waveform, control is made by means of the advancing control circuit and the closing angle control circuit. As a result, the timing advance takes place, as shown in Fig. "C."



INSPECTION

SIGNAL GENERATOR

Measure the resistance between lead wires. If the resistance is infinity or less than the specifications, the signal generator must be replaced.

09900 - 25002	Pocket tester

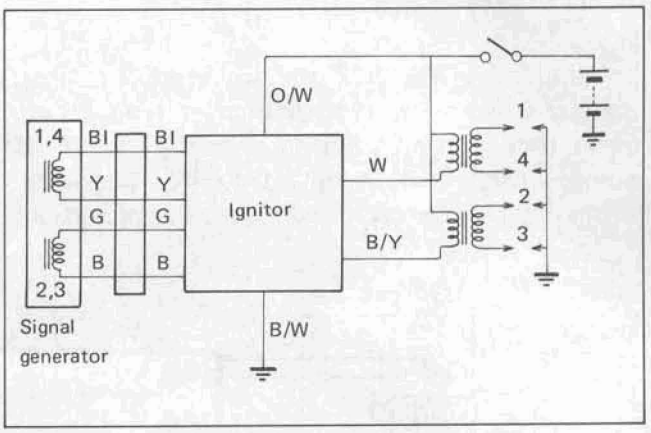
STD resistance	
Blue – Yellow	Approx. 140 – 180 Ω
Green – Black	

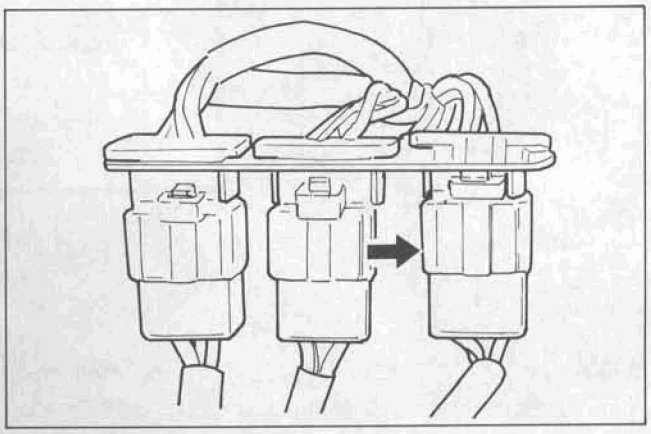
IGNITOR UNIT

- Remove the spark plugs from Nos. 1 and 2 cylinders. Install the respective plug caps and place spark plus on the cylinder head.
- Remove the frame cover on the left side and disconnect the coupler from the signal generator.
- As indicated in Fig. 1, connect the pocket tester alternately to the terminals provided inside the coupler. For this test, use the "RX1" range of the tester and set the ignition switch at the ON position. If the ignitor unit is functioning normally, a spark will occur at the spark plug at the moment when both of the tester pins ⊕ and ⊖ are removed from the terminals simulateneously.

09900 - 25002	Pocket tester

NOTE:
This checking presupposes that the ignition coil used for checking is a good one.





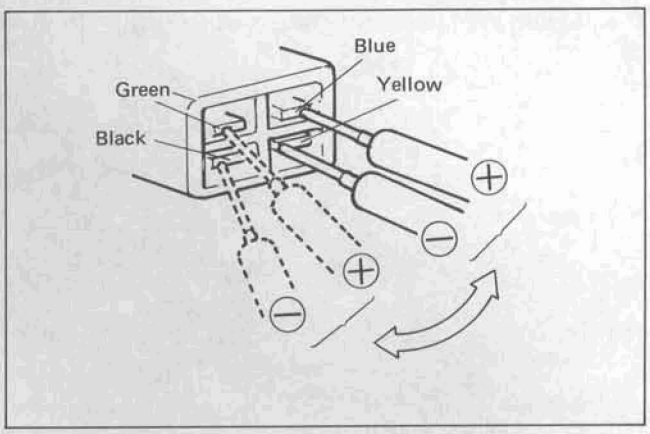
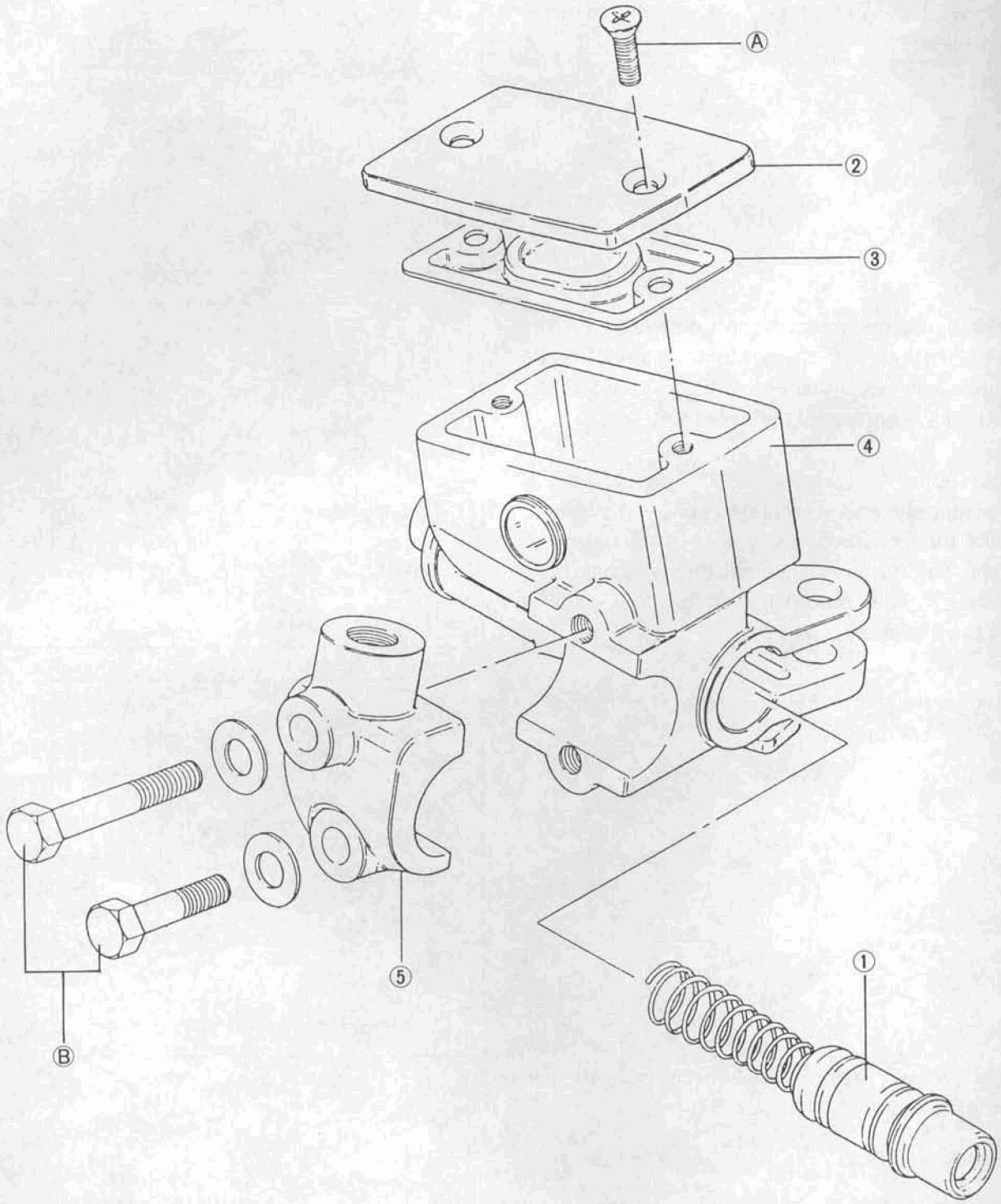


Fig. 1

FRONT MASTER CYLINDER

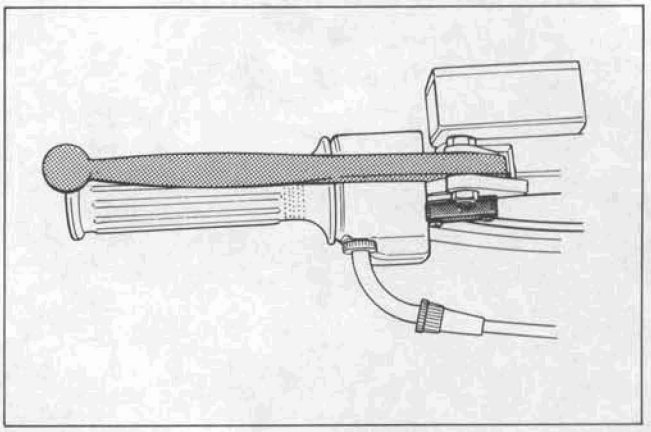


① Piston and cup set
② Cap
③ Diaphragm
④ Body
⑤ Holder

	Tightening torque	
	kg-m	lb-ft
Ⓐ	0.08 – 0.15	0.6 – 1.1
Ⓑ	0.5 – 0.8	3.5 – 6.0

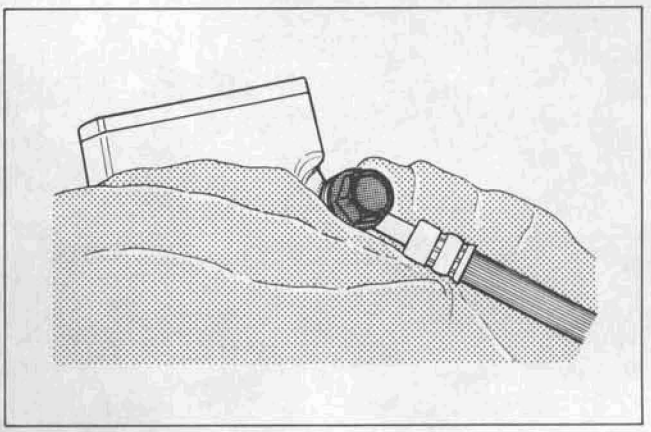
MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Remove the front brake light switch and front brake lever.

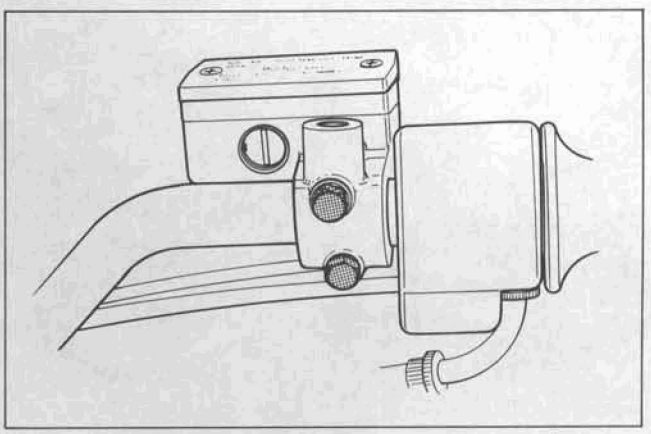


- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

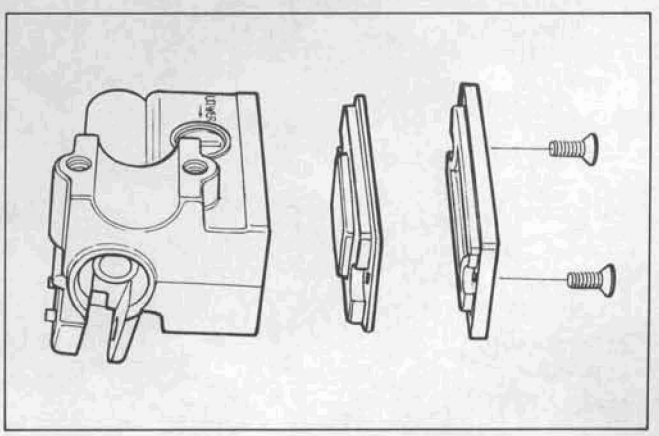
CAUTION:
Immediately and completely, wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paints, plastics, rubber materials, etc. and will damage them severely.



- Remove the master cylinder ass'y after removing two fitting bolts.

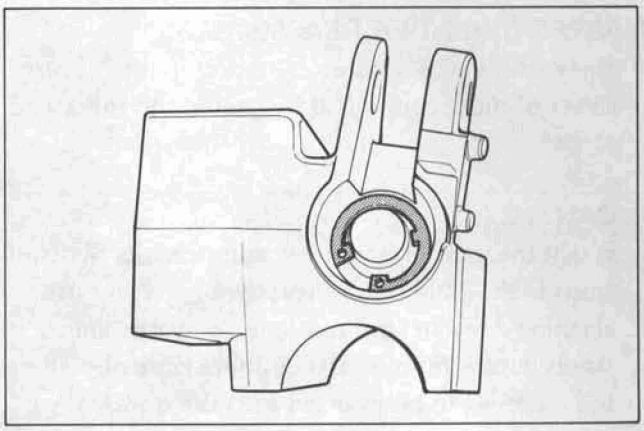


- Unscrew two fitting screws and remove the cap and diaphragm.

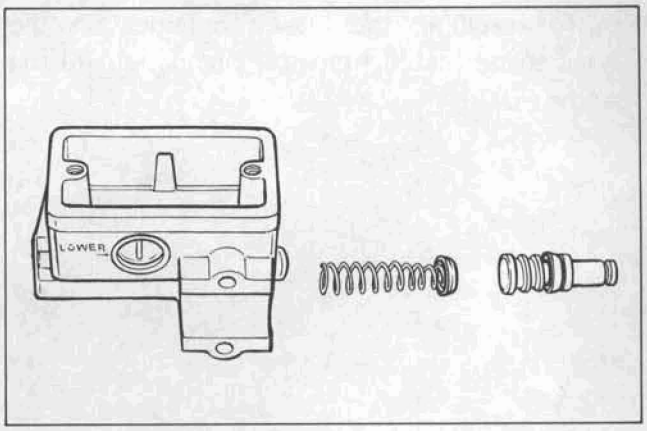


- Pull off dust seal boot and remove the circlip by using special tool.

09900 - 06108	Snap ring pliers

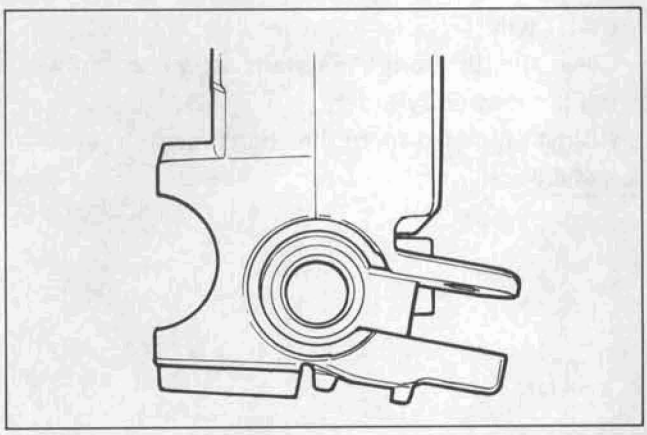


- Pull out piston, primary cup and spring.

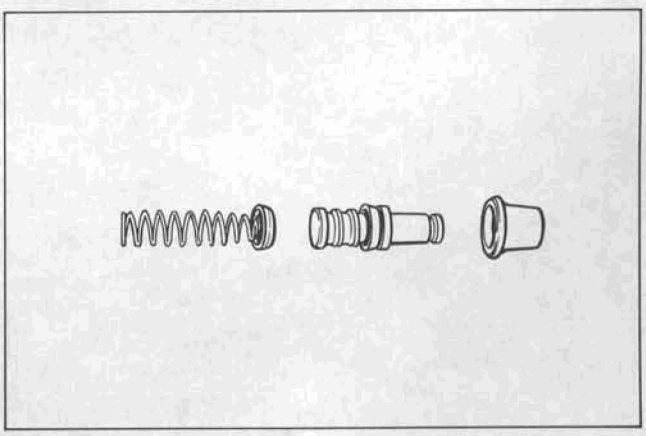


MASTER CYLINDER INSPECTION

- Inspect the cylinder bore wall for any scratch or other damage.



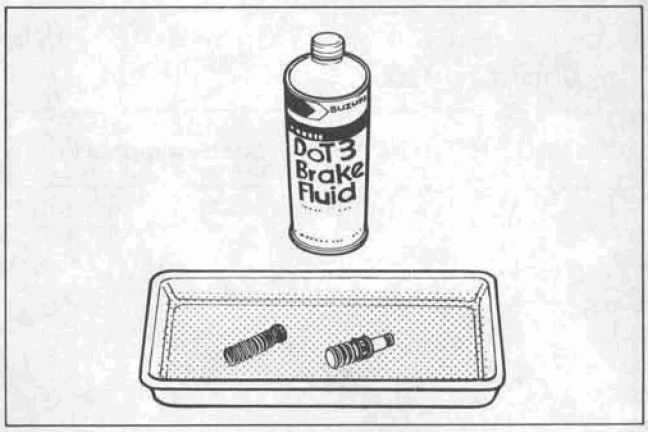
- Inspect the piston surface for scratch or other damage.
- Inspect the primary cup, secondary cup and dust seal boot for damage.



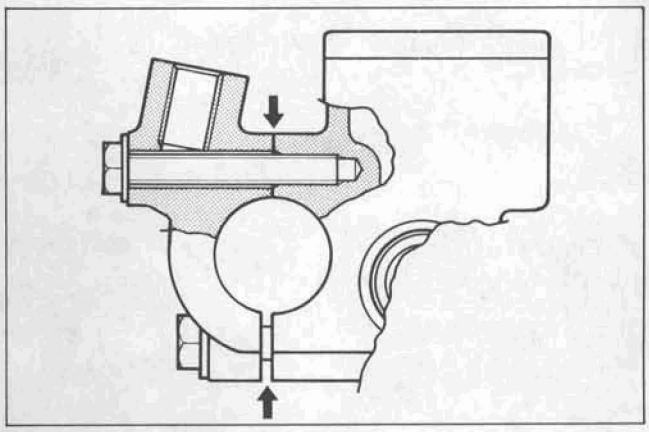
MASTER CYLINDER REASSEMBLY

- Reassemble the master cylinder in the reverse order of disassembly and by taking the following steps:

CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them. Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

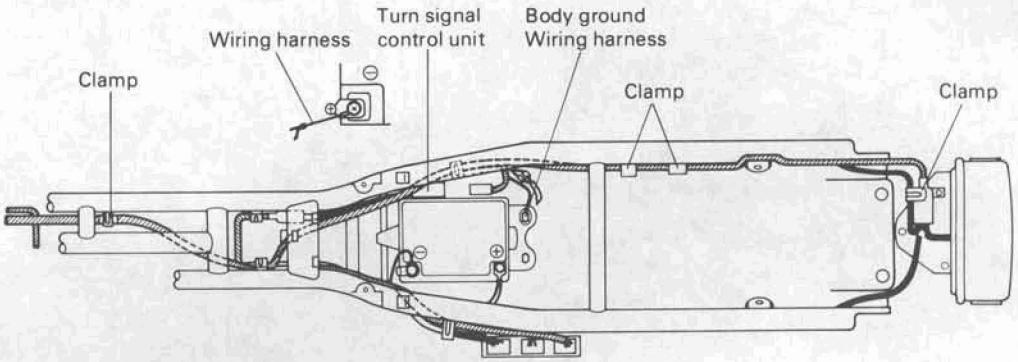


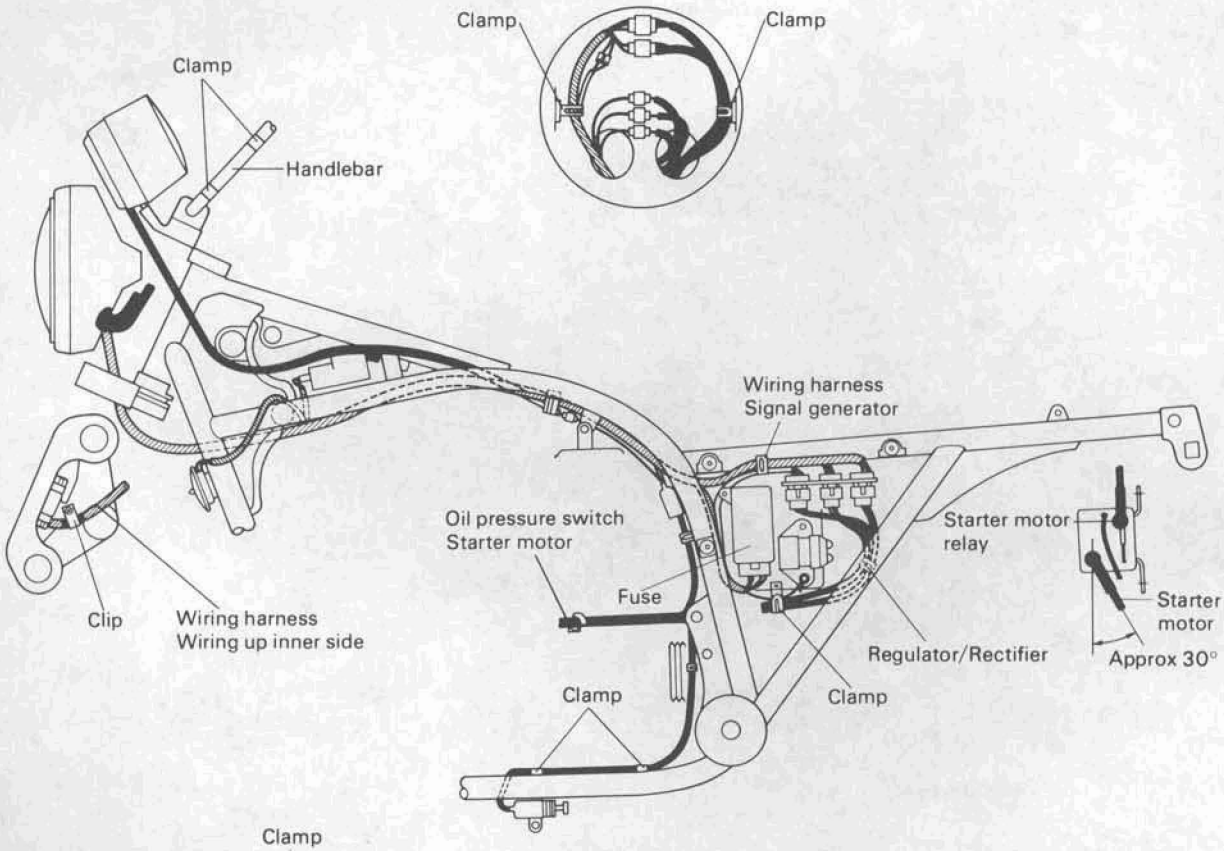
- When installing the master cylinder on the handlebars, first tighten the clamp bolt on the upper side.

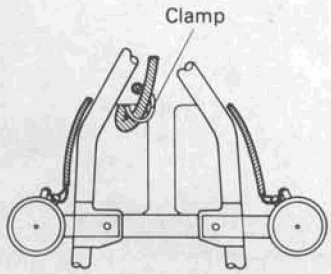


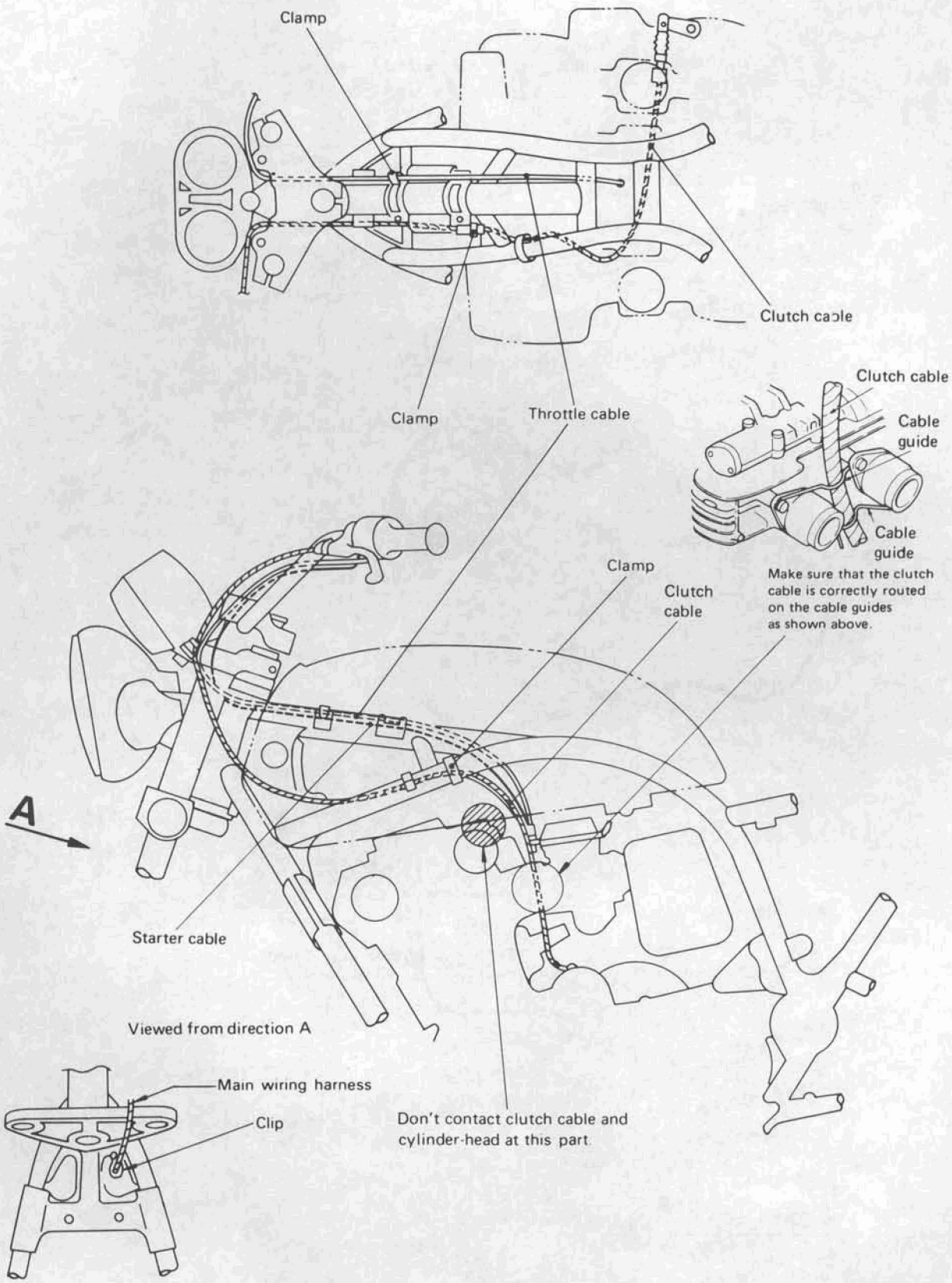
CAUTION:
Bleed the air from the circuit after reassembling the master cylinder.
Adjust the front brake light switch after installation.

WIRE AND CABLE ROUTING

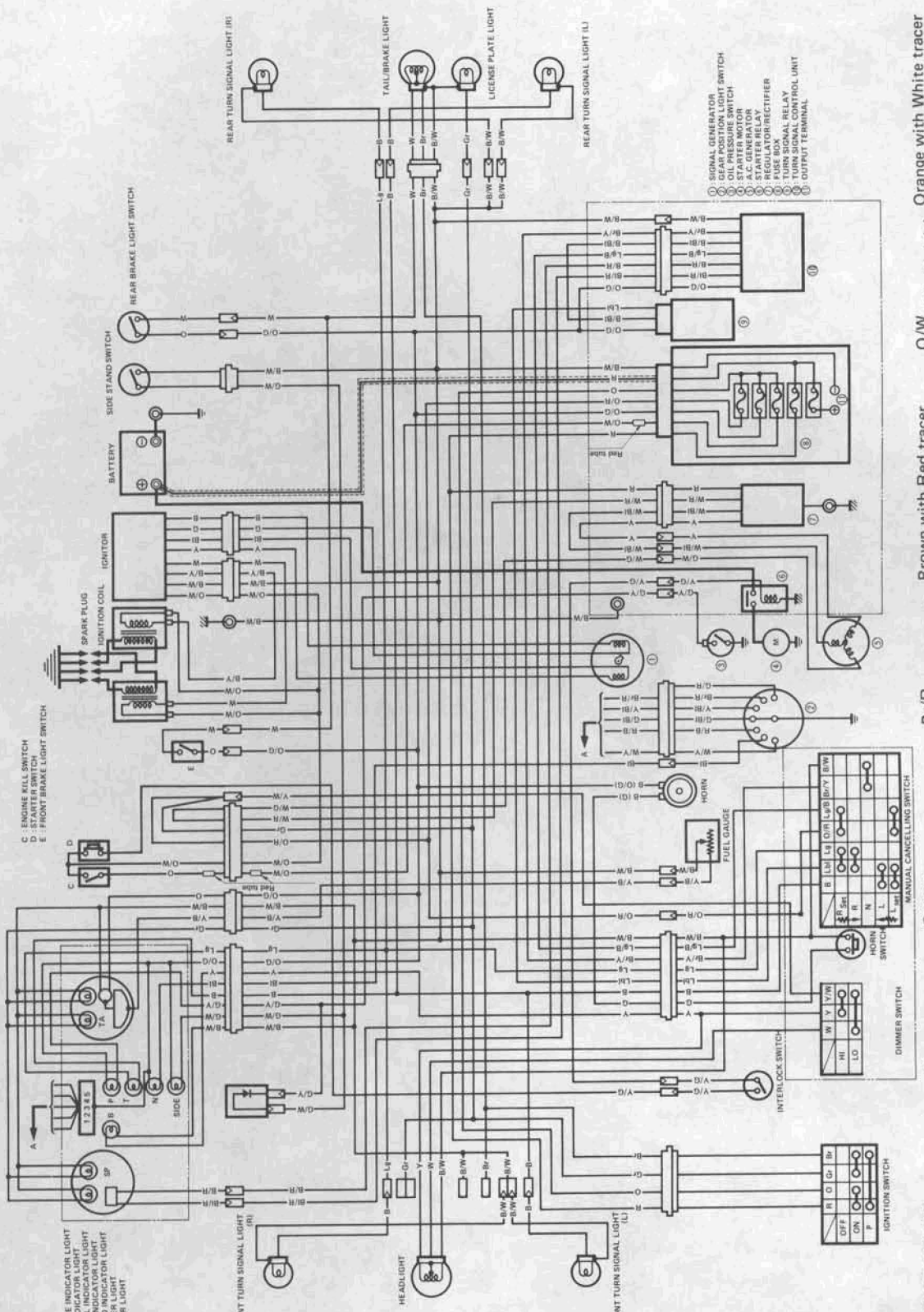







Clamp
Clutch cable
Clamp
Throttle cable
Clutch cable
Cable guide
Cable guide
Make sure that the clutch cable is correctly routed on the cable guides as shown above.
Clamp
Clutch cable
A
Starter cable
Viewed from direction A
Main wiring harness
Clip
Don't contact clutch cable and cylinder-head at this part.

WIRING DIAGRAM



WIRE COLOR

B	Black	O	Orange
Bl	Blue	R	Red
Br	Brown	W	White
G	Green	Y	Yellow
Gr	Gray	B/Bl	Black with Blue tracer
Lbl	Light blue	B/R	Black with Red tracer
Lg	Light green	B/W	Black with White tracer
		B/Y	Black with Yellow tracer
		Bl/R	Blue with Red tracer
		Br/R	Brown with Red tracer
		Br/Y	Brown with Yellow tracer
		G/Bl	Green with Blue tracer
		G/R	Green with Red tracer
		G/W	Green with White tracer
		G/Y	Green with Yellow tracer
		Lg/B	Light green with Black tracer
		O/G	Orange with Green tracer
		O/R	Orange with Red tracer
		O/W	Orange with White tracer
		R/B	Red with Black tracer
		W/Bl	White with Blue tracer
		W/G	White with Green tracer
		W/R	White with Red tracer
		W/Y	White with Yellow tracer
		Y/B	Yellow with Black tracer
		Y/Bl	Yellow with Blue tracer
		Y/G	Yellow with Green tracer
		Y/W	Yellow with White tracer

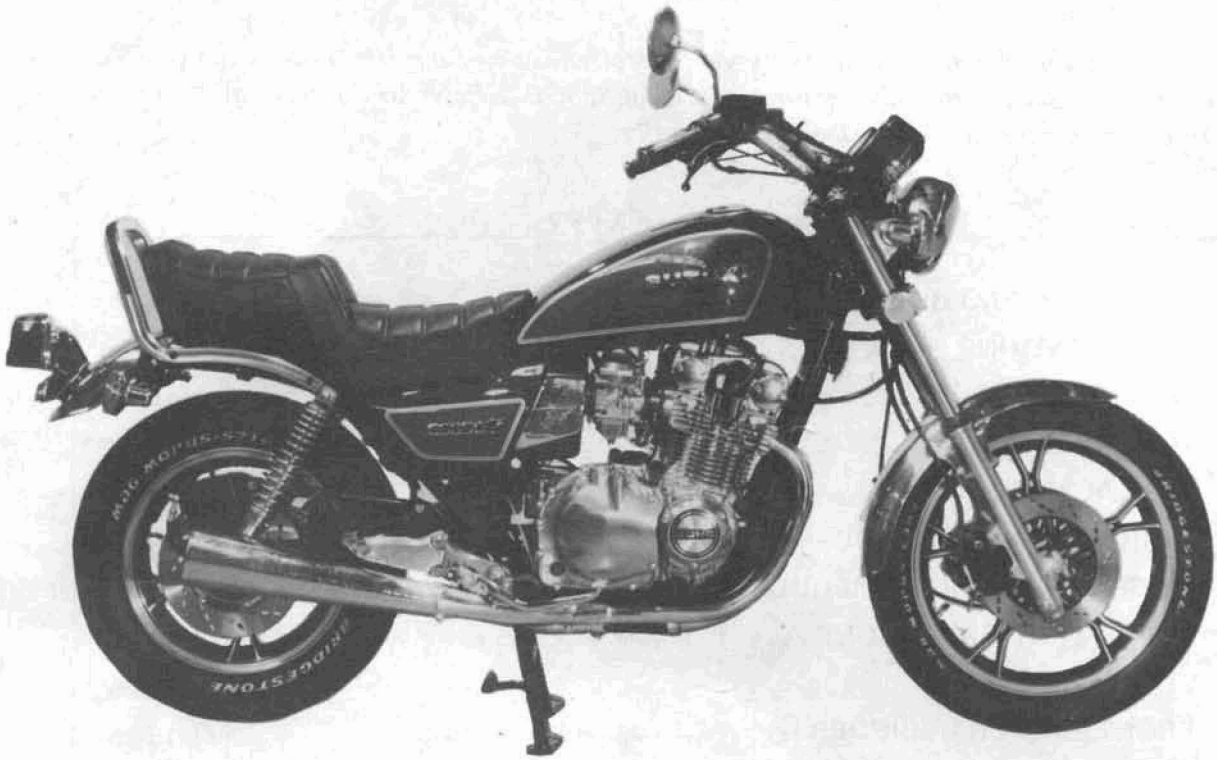
GS850GLZ

This section gives service data and servicing procedures which differ those of the GS850-GLX and describes the new features of the GS850GLZ. Refer to the sections 1 through 16 except for the items described in this section.

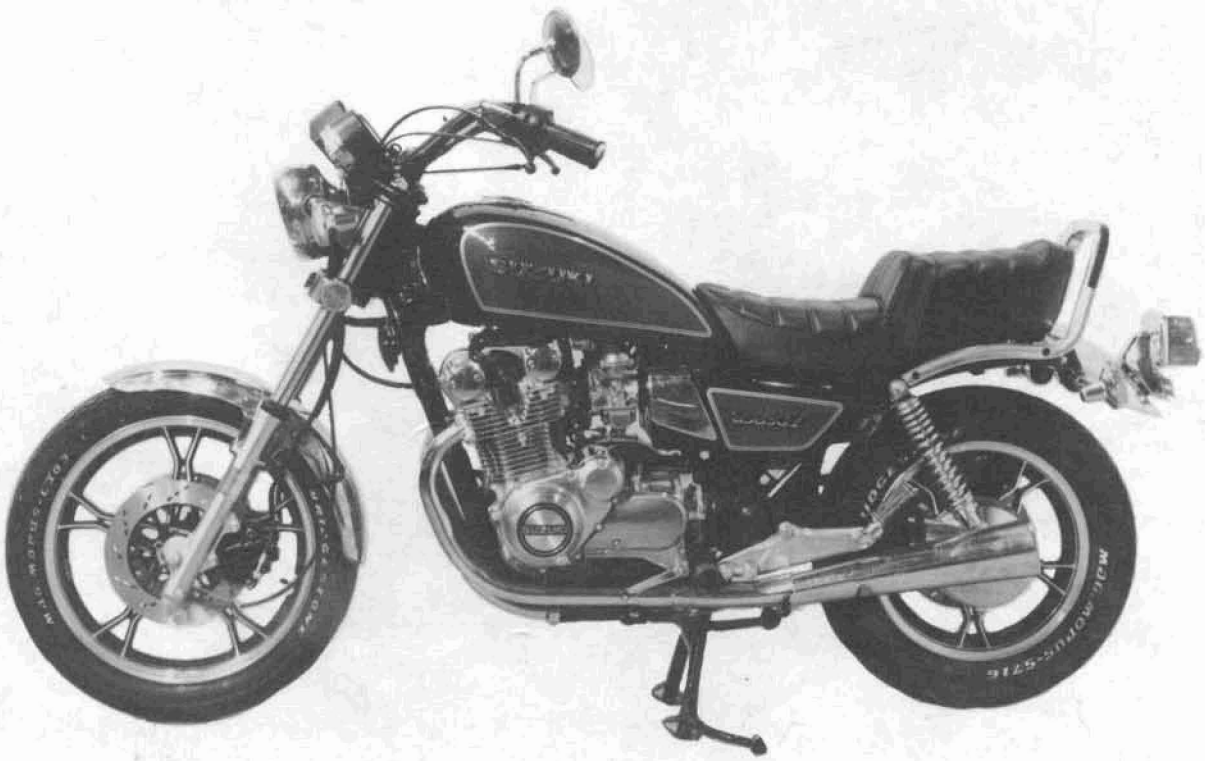
CONTENTS

VIEW OF SUZUKI GS850GLZ 18- 2
SPECIFICATIONS 18- 3
SERVICE DATA 18- 5
TORQUE TABLE 18-15
SPECIAL MATERIALS 18-18
PERIODIC MAINTENANCE 18-20
EMISSION CONTROL & REGULATIONS 18-21
COVER TIGHTENING BOLT 18-25
STARTER LEVER 18-25
FRONT MASTER CYLINDER 18-26
WIRE AND CABLE ROUTING 18-30
WIRING DIAGRAM 18-32

VIEW OF SUZUKI GS850GLZ



Right side



Left side

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 250 mm (88.6 in)
Overall width	855 mm (33.7 in)
Overall height	1 130 mm (44.5 in)
Wheelbase	1 510 mm (59.4 in)
Ground clearance	145 mm (5.7 in)
Seat height	*765 mm (30.1 in)
Dry mass	243 kg (536 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm^3 (51.4 cu. in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI BS32SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.722 (31/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.923 (24/26)

SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 30′
Trail	105 mm (4.13 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	100/90-19 57H (Tubeless tire)
Rear tire size	130/90-16 67H (Tubeless tire)
Front tire pressure	1.75 kg/cm² (24 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank including reserve		17 L (4.5 US gal)
	reserve	4.5 L (4.8 US qt)
Engine oil	change	3.0 L (3.2 US qt)
	filter change	3.6 L (3.8 US qt)
	overhaul	3.8 L (4.0 US qt)
Secondary bevel gear oil		340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil		280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure		0.8 kg/cm² (11.4 psi)
Front fork oil		245 ml (8.27 US oz) in each leg

Specifications subject to change without notice.

* Asterisk indicates new Z model specifications.

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	36.0 (1.42)	—
	EX.	30.0 (1.18)	—
Valve lift	IN.	8.0 (0.31)	—
	EX.	7.5 (0.30)	—
Valve clearance or Tappet clearance (when cold)	IN.& EX.	0.03 – 0.08 (0.001 – 0.003)	—
Valve guide to Valve stem clearance	IN.	0.025 – 0.055 (0.0009 – 0.0022)	0.35 (0.014)
	EX.	0.040 – 0.070 (0.0016 – 0.0028)	0.35 (0.014)
Valve guide I.D.	IN.& EX.	7.000 – 7.015 (0.2756 – 0.2762)	—
Valve stem O.D.	IN.	6.960 – 6.975 (0.2740 – 0.2746)	—
	EX.	6.945 – 6.960 (0.2734 – 0.2740)	—
Valve stem runout	IN.& EX.	—	0.05 (0.002)
Valve head thickness	IN.& EX.	—	0.5 (0.02)
Valve seat width	IN. & EX.	1.0 – 1.2 (0.04 – 0.05)	—
Valve head radial runout	IN.& EX.	—	0.03 (0.001)
Valve spring free length (IN. & EX.)	INNER	—	33.9 (1.33)
	OUTER	—	41.3 (1.63)
Valve spring tension (IN. & EX.)	INNER	29.3 – 34.0 kg (64.59 – 74.96 lbs) at length 23 mm (0.91 in)	—
	OUTER	50.4 – 58.3 kg (111.11 – 128.53 lbs) at length 27 mm (1.06 in)	—

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	36.320 – 36.360 (1.4299 – 1.4315)	36.020 (1.4181)
	EX.	35.770 – 35.810 (1.4083 – 1.4098)	35.470 (1.3965)
Camshaft journal oil clearance	IN. & EX.	0.037 – 0.065 (0.0015 – 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012 – 22.025 (0.8666 – 0.8671)	———
Camshaft journal O.D.	IN. & EX.	21.960 – 21.975 (0.8646 – 0.8652)	———
Camshaft runout	IN. & EX.	———	0.1 (0.004)
Cam chain 20 pitch length		———	157.80 (6.213)
Cam chain pin (at arrow "3")		20 th pin	———
Cylinder head distortion		———	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure	9 – 12 kg/cm² (128 – 171 psi)			7 kg/cm² (100 psi)
Compression pressure difference	—			2 kg/cm² (28 psi)
Piston to Cylinder clearance	0.050 – 0.060 (0.0020 – 0.0024)			0.120 (0.0047)
Cylinder bore	69.000 – 69.015 (2.7165 – 2.7171)			69.080 (2.7197)
Piston diam.	68.945 – 68.960 (2.7144 – 2.7150) Measure the 15 (0.59) from piston skirt end.			68.880 (2.7118)
Cylinder distortion	—			0.2 (0.008)
Piston ring free end gap	1st	N	Approx. 9.0 (0.35)	7.2 (0.28)
	2nd	N	Approx. 9.5 (0.37)	7.6 (0.30)
Piston ring end gap	1st		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
	2nd		0.10 – 0.30 (0.004 – 0.012)	0.7 (0.03)
Piston ring groove clearance	1st		—	0.18 (0.0071)
	2nd		—	0.15 (0.0059)
Piston ring groove width	1st		1.21 – 1.23 (0.047 – 0.048)	—
	2nd		1.21 – 1.23 (0.047 – 0.048)	—
	Oil		2.51 – 2.53 (0.099 – 0.100)	—
Piston ring thickness	1st		1.175 – 1.190 (0.0463 – 0.0469)	—
	2nd		1.170 – 1.190 (0.0461 – 0.0469)	—
Piston pin bore I.D.	16.002 – 16.008 (0.6300 – 0.6302)			16.030 (0.6311)
Piston pin O.D.	15.995 – 16.000 (0.6297 – 0.6300)			15.980 (0.6291)

CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.006 – 16.014 (0.6302 – 0.6305)	16.040 (0.6315)
Conrod deflection	———	3.0 (0.12)
Conrod big end side clearance	0.10 – 0.65 (0.004 – 0.026)	1.0 (0.039)
Crankshaft runout	———	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pump reduction ratio	1.723 (87/49 x 33/34)	———
Oil pressure (at 60° C, 140° F)	Above 0.1 kg/cm² (1.4 psi) Below 0.5 kg/cm² (7.1 psi) at 3 000 r/min	———

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2 – 3 (0.08 – 0.12)	———
Drive plate thickness	2.7 – 2.9 (0.106 – 0.114)	2.4 (0.094)
Drive plate claw width	11.8 – 12.0 (0.46 – 0.47)	11.0 (0.43)
Driven plate thickness	2.0 ± 0.06 (0.08 ± 0.002)	———
Driven plate distortion	———	0.1 (0.004)
Clutch spring free length	———	38.5 (1.52)

TRANSMISSION

Unit: mm (in)

ITEM	STANDARD		LIMIT
Primary reduction	1.775 (87 / 49)		—
Secondary reduction	1.062 (17 / 16)		—
Final reduction	3.090 (34 / 11)		—
Gear ratios	Low	2.500 (35 / 14)	—
	2nd	1.722 (31 / 18)	—
	3rd	1.380 (29 / 21)	—
	4th	1.125 (27 / 24)	—
	Top	0.923 (24 / 26)	—
Shift fork to Groove clearance	0.4 – 0.6 (0.016 – 0.024)		0.8 (0.031)
Shift fork groove width	5.45 – 5.55 (0.215 – 0.219)		—
Shift fork thickness	4.95 – 5.05 (0.195 – 0.199)		—

SHAFT DRIVE

Unit: mm (in)

ITEM	STANDARD	LIMIT
Secondary bevel gear backlash	0.08 – 0.13 (0.003 – 0.005)	—
Final bevel gear backlash	0.03 – 0.64 (0.001 – 0.025)	—
Secondary drive bevel gear preload	3 – 5 kg·cm (2.60 – 4.35 lb·in)	—
Secondary driven bevel gear preload	4 – 7 kg·cm (3.45 – 6.05 lb·in)	—
Final drive bevel gear preload	4 – 8 kg·cm (3.45 – 6.95 lb·in)	—

CARBURETOR

Unit: mm (in)

ITEM		SPECIFICATION
Carburetor type		MIKUNI BS32SS
Bore size		32 (1.26)
I. D. No.		* 45160
Idle r/min.		1 050 ± 100 r/min.
Fuel level		5.0 ± 0.5 (0.20 ± 0.02)
Float height		22.4 ± 1.0 (0.88 ± 0.04)
Main jet	(M. J.)	# 115
Main air jet	(M. A. J.)	1.7
Jet needle	(J. N.)	5D50
Needle jet	(N. J.)	X-5
Pilot jet	(P. J.)	# 40
By pass	(B. P.)	1.0, 0.8, 0.8
Pilot outlet	(P. O.)	0.7
Valve seat	(V. S.)	2.0
Starter jet	(G. S.)	# 32.5
Pilot screw	(P. S.)	PRE-SET
Pilot air jet	(P. A. J.)	* # 180
Throttle cable play		0.5 – 1.0 (0.02 – 0.04)

* Asterisk indicates new Z model specifications.

ELECTRICAL

Unit: mm (in)

ITEM	SPECIFICATION		
Ignition timing	17° B. T. D. C. Below 1 500 ± 150 r/min. and 37° B. T. D. C. Above 2 350 ± 150 r/min.		
Firing order	1, 2, 4, 3		
Spark plug	Type	NGK : B8ES N. D. : W24ES-U	
	Gap	0.6 – 0.8 (0.024 – 0.031)	
Spark performance	Over 8 (0.3) at 1 atm.		
Signal coil resistance	Approx.	290 – 360 Ω	BI-G
Ignition coil resistance	Primary	O/W – W Approx. 3 – 5Ω	
	Secondary	Plug cap – Plug cap Approx. 31 – 33 kΩ	
Generator No-Load voltage	More than 80 V (AC) at 5 000 r/min.		
Regulated voltage	14.0 – 15.5 V at 5 000 r/min.		
Starter motor	Brush length	Limit: 6 (0.24)	
	Commutator under cut	Limit: 0.2 (0.008)	
Starter relay resistance	3 – 4 Ω		
Battery	Type designation	YB14L – A2	
	Capacity	12V 50.4kC (14Ah)/10HR	
	Standard electrolyte S. G.	1.28 at 20°C (68°F)	
Fuse size	Headlight	10A	
	Turn signal	10A	
	Ignition	10A	
	Main	15A	
	Output terminal	10A	

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal height		15 (0.6)	—
Brake disc thickness	Front	5.0 ± 0.2 (0.2 ± 0.008)	4.5 (0.18)
	Rear	6.7 ± 0.2 (0.26 ± 0.008)	6.0 (0.24)
Brake disc runout		—	0.30 (0.012)
Master cylinder cylinder bore	Front	15.870 – 15.913 (0.6248 – 0.6265)	—
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston diam.	Front	15.827 – 15.854 (0.6231 – 0.6242)	—
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	—
Brake caliper cylinder bore	Front	38.180 – 38.256 (1.5031 – 1.5061)	—
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	—
Brake caliper piston diam.	Front	38.098 – 38.148 (1.4999 – 1.5019)	—
	Rear	38.098 – 38.148 (1.4999 – 1.5019)	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Tire size	Front	100/90-19 57H (Tubeless tire)	—
	Rear	130/90-16 67H (Tubeless tire)	—
Tire tread depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	160 (6.3)	———
Front fork spring free length	———	516 (20.3)
Front fork oil level	260 (10.2)	———
Front fork air pressure	0.8 kg/cm² (11.4 psi)	———
Rear wheel travel	100 (3.9)	———

FUEL + OIL + CAPACITY

ITEM	SPECIFICATION	
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.	
Fuel tank including reserve	17 L (4.5 US gal)	
reserve	4.5 L (4.8 US qt)	
Engine oil type	SAE 10W/40	
Engine oil capacity	Change	3 000 ml (3.2 US qt)
	Filter change	3 600 ml (3.8 US qt)
	Overhaul	3 800 ml (4.0 US qt)
Front fork oil type	Fork oil # 15	
Front fork oil capacity (each leg)	245 ml (8.27 US oz)	
Bevel gear oil type	Hypoid Gear oil SAE 90, API grade GL-5	
Bevel gear oil capacity	Secondary	340 – 400 ml (11.5 – 13.5 US oz)
	Final	280 – 330 ml (9.5 – 11.2 US oz)
Brake fluid type	DOT3 or DOT4	

TIRE PRESSURE

GOLD INFLATION TIRE PRESSURE	NORMAL RIDING				CONTINUOUS HIGH SPEED RIDING			
	SOLO RIDING		DUAL RIDING		SOLO RIDING		DUAL RIDING	
	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi
FRONT	1.75	24	1.75	24	2.00	28	2.25	32
REAR	2.00	28	2.50	36	2.25	32	2.80	40

WATTAGE

Unit: W (cp)

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
Turn signal light		23 (32)
Speedometer light		3.4
Tachometer light		3.4
Fuelmeter light		*1.7
Turn signal indicator light		3.4
High beam indicator light		3.4
Neutral indicator light		3.4
Oil pressure indicator light		3.4
* Side stand check light		3.4

* Asterisk indicates new Z model specifications.

TORQUE TABLE

ENGINE

ITEM	kg-m	lb-ft
Cylinder head cover bolt	0.6 – 1.0	4.5 – 7.0
Cylinder head bolt	0.7 – 1.1	5.0 – 8.0
Cylinder head nut	3.5 – 4.0	25.5 – 29.0
Camshaft bearing cap bolt	0.8 – 1.2	6.0 – 8.5
Camshaft sprocket bolt	2.4 – 2.6	17.5 – 19.0
Cam chain idler bolt	0.6 – 1.0	4.5 – 7.0
Cam chain guide No. 2 bolt	0.4 – 0.7	3.0 – 5.0
Generator rotor bolt	6.0 – 7.0	43.5 – 50.5
Advance governor bolt	1.8 – 2.3	13.0 – 16.5
Starter motor bolt	0.4 – 0.7	3.0 – 5.0
Starter clutch bolt	1.5 – 2.0	11.0 – 14.5
Clutch sleeve hub nut	5.0 – 7.0	36.0 – 50.5
Clutch spring bolt	1.1 – 1.3	8.0 – 9.5
Clutch release arm bolt	0.6 – 1.0	4.5 – 7.0
Oil strainer screw	0.6 – 1.0	4.5 – 7.0
Gear shifting cam stopper spring holder bolt	1.8 – 2.8	13.0 – 20.0
Gear shift arm stopper bolt	1.5 – 2.3	11.0 – 16.5
Crankcase bolt (6 mm)	0.6 – 1.0	4.5 – 7.0
Crankcase bolt (8 mm)	1.8 – 2.2	13.0 – 16.0
Engine mounting nut (10 mm)	2.5 – 4.5	18.0 – 32.5
Engine mounting nut (12 mm)	4.5 – 7.0	32.5 – 50.5
Exhaust pipe bolt	0.9 – 1.4	6.5 – 10.0
Muffler bolt	1.8 – 2.8	13.0 – 20.0
Gear shift lever bolt	1.3 – 2.3	9.5 – 16.5
Secondary drive gear nut	12.0 – 15.0	87.0 – 108.5
Secondary driven gear nut	9.0 – 11.0	65.0 – 79.5
Secondary drive housing bolt	2.0 – 2.6	14.5 – 19.0
Secondary driven housing bolt	2.0 – 2.6	14.5 – 19.0

CHASSIS

ITEM	kg-m	lb-ft
Handlebar clamp bolt	1.2 – 2.0	8.5 – 14.5
Steering stem upper clamp bolt	1.5 – 2.5	11.0 – 18.0
Front fork upper bracket bolt (R, L)	2.0 – 3.0	14.5 – 21.5
Front fork lower bracket bolt (R, L)	1.5 – 2.5	11.0 – 18.0
*Steering stem head bolt	2.0 – 3.0	14.5 – 21.5
Front fork axle holder nut	1.5 – 2.5	11.0 – 18.0
Front axle shaft nut	3.6 – 5.2	26.0 – 37.5
Swinging arm pivot bolt	0.35 – 0.45	2.5 – 3.0
Swinging arm pivot nut	11.0 – 13.0	79.5 – 94.0
Rear torque link nut	2.0 – 3.0	14.5 – 21.5
Rear axle nut	5.0 – 8.0	36.0 – 58.0
Rear shock absorber nut	2.0 – 3.0	14.5 – 21.5
Footrest bolt	2.7 – 4.3	19.5 – 31.0
Front brake caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Front and rear brake disc plate bolt	1.5 – 2.5	11.0 – 18.0
Front brake caliper axle bolt	1.5 – 2.0	11.0 – 14.5
Front brake master cylinder mounting bolt	0.5 – 0.8	3.5 – 6.0
Front and rear brake hose union bolt	1.3 – 1.8	9.5 – 13.0
Front and rear brake oil bleeder bolt	0.6 – 0.9	4.5 – 6.5
Rear brake caliper mounting bolt	2.0 – 3.0	14.5 – 21.5
Rear brake caliper axle bolt	2.5 – 3.5	18.0 – 25.5
Rear brake master cylinder mounting bolt	1.5 – 2.5	11.0 – 18.0
Final drive gear nut	9.0 – 11.0	65.0 – 79.5
Final drive gear housing nut	3.5 – 4.5	25.5 – 32.5
Propeller shaft bolt	3.0 – 4.0	21.5 – 29.0
Final gear bearing case bolt	2.0 – 2.6	14.5 – 19.0
Final gear case shock mount stud bolt	9.0 – 11.0	65.0 – 79.5
Final case oil filler plug	2.0 – 3.0	14.5 – 21.5

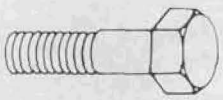
* Asterisk indicates new Z model specifications.

TIGHTENING TORQUE CHART

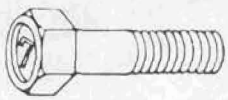
For other bolts and nuts not listed on previous pages, refer to this chart:

TIGHTENING TORQUE

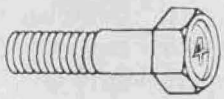
Thread Diameter (mm)	Conventional or "4" Marked Bolt		"7" Marked Bolt	
	kg-m	lb-ft	kg-m	lb-ft
4	0.1 – 0.2	0.7 – 1.5	0.15 – 0.3	1.0 – 2.0
5	0.2 – 0.4	1.5 – 3.0	0.3 – 0.6	2.0 – 4.5
6	0.4 – 0.7	3.0 – 5.0	0.8 – 1.2	6.0 – 8.5
8	1.0 – 1.6	7.0 – 11.5	1.8 – 2.8	13.0 – 20.0
10	2.2 – 3.5	16.0 – 25.5	4.0 – 6.0	29.0 – 43.5
12	3.5 – 5.5	25.5 – 40.0	7.0 – 10.0	50.5 – 72.5
14	5.0 – 8.0	36.0 – 58.0	11.0 – 16.0	79.5 – 115.5
16	8.0 – 13.0	58.0 – 94.0	17.0 – 25.0	123.0 – 181.0
18	13.0 – 19.0	94.0 – 137.5	20.0 – 28.0	144.5 – 202.5



Conventional Bolt



"7" Marked Bolt

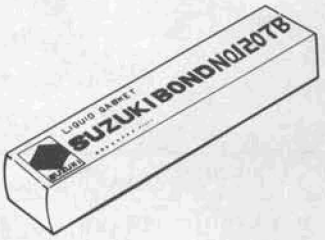
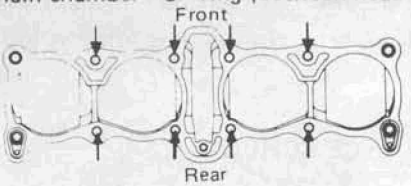
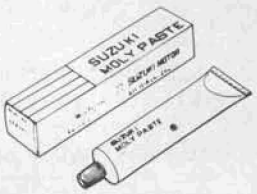


"4" Marked Bolt

SPECIAL MATERIALS

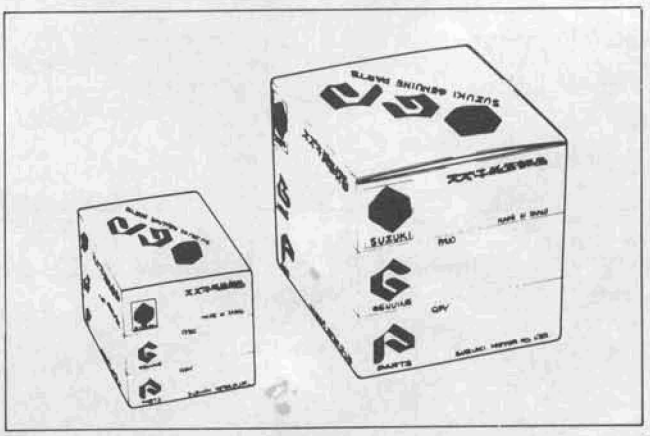
The materials listed below are needed for maintenance work on theGS850GL,and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

Material	Part
 99000-25030 SUZUKI SUPER GREASE "A"	* Oil seals * Throttle grip * Cables (Speedometer and tachometer) * Clutch release mechanism * Wheel bearings * Swinging arm bearing * Steering stem bearing
 99000-32040 THREAD LOCK CEMENT	* Oil filter cover nut . . . . . 3 pcs * Camshaft end cap screw . . . . . 8 pcs * Front fork allen bolt . . . . . 2 pcs * Carburetor adjuster bracket screw. . . . . 2 pcs * Carburetor plate screw . . . . . 8 pcs * Carburetor starter shaft screw . . . . . 4 pcs
 99000-32050 THREAD LOCK "1342"	* Gearshift cam guide screw. . . . . 2 pcs * Gearshift pawl screw . . . . . 2 pcs * Countershaft B/G retainer screw . . . . . 3 pcs * Driveshaft plate screw . . . . . 3 pcs * Generator starter screw . . . . . 3 pcs * Generator lead wire guide screw . . . . . 3 pcs * Engine oil pump screw . . . . . 4 pcs * Oil gallery plate screw . . . . . 3 pcs * Secondary drive bevel gear assy set bolt . . . . . 4 pcs * Secondary driven bevel gear assy set bolt . . . . . 4 pcs * Final bevel gear bearing holder screw. . . . . 3 pcs * Final bearing case bolt . . . . . .10 pcs
 99000-32020 THREAD LOCK SUPER "1333B"	* Thread portion of secondary driven gear * Thread portion of final drive gear * Propeller shaft joint bolt. . . . . 4 pcs * Stater clutch allen bolt . . . . . 3 pcs * Cam chain guide bolt . . . . . 3 pcs * Gearshift stopper. . . . . 1 pc

Material	Part
 99000-32030 THREAD LOCK SUPER "1303"	* Cam sprocket bolt. . . . . 4 pcs
 99104-31140 SUZUKI BOND No. 1207B	* Cylinder stud bolt . . . . . 8 pcs (Apply a small quantity to the threads of cylinder stud bolts.) Cam chain chamber "O" ring (between head and cylinder)  * Mating surfaces of upper and lower crankcase. * Final gear case * Joint portion of rear swinging arm and final gear case.
 99000-25100 SUZUKI SILICONE GREASE	* Apply to caliper axle shaft
 99000-25140 SUZUKI MOLY PASTE	* Valve stem * Camshaft journal * Chain tensioner adjuster shaft * Counter shaft washer * Outer counter shaft * Input cam dog

USE OF GENUINE SUZUKI PARTS

To replace any part of the machine, use a genuine SUZUKI replacement part. Imitation parts or parts supplied from any other source than SUZUKI, if used to replace SUZUKI parts can reduce the machine's performance and, even worse, could induce costly mechanical troubles.



PERIODIC MAINTENANCE

IMPORTANT: The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also enhance the reliability and performance of the motorcycle.

NOTE:
Vehicles operated under severe conditions may require more frequent servicing.

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and to maintain proper emission levels. Mileages are expressed in terms of kilometers, miles and time for your convenience.

PERIODIC MAINTENANCE SCHEDULE

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST						
	Mile	600	4 000	7 500	11 000	15 000
	km	1 000	6 000	12 000	18 000	24 000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		–	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		–	C	C	C	C
Tappet clearance		I	I	I	I	I
Spark plug		–	C	R	C	R
Fuel line		Replace every two years				
Engine oil and oil filter		R	R	R	R	R
Engine idle speed		I	I	I	I	I
Clutch		I	I	I	I	I
Secondary and Final gear oil		Change oil at initial 600 miles (1 000 km) every 7 500 miles (12 000 km)				
Brake hose		Replace every two years				
Brake		I	I	I	I	I
Tires		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front forks		–	–	I	–	I
		Check air pressure every 6 months.				

NOTE: T = Tighten, I = Inspect, R = Replace, C = Clean

EMISSION CONTROL & REGULATIONS

EMISSION REGULATIONS

On February 4, 1977, Federal Emission Regulations for motorcycles that may be licensable took effect. The regulations provided for a gradual, multi-step application of stricter emission limits beginning with all effected motorcycles manufactured after January 1, 1978, culminating with the present 1980 emission level restrictions. For the 1980 and succeeding years one set of emission limits will be in effect. They are as follows:

1980 EMISSION LIMITS

CATEGORIES	HYDROCARBONDS (HC)	CARBON MONOXIDE
All motorcycles 50 cc – Larger	5.0 Grams/Kilometer (8.0 Grams/Mile)	12 Grams/Kilometer (19.3 Grams/Mile)

Emission-controlled motorcycles which are subject to the emission regulations are those motorcycles which are equipped with a headlight, taillight, stoplight and which have an engine displacement larger than 50 cc.

Suzuki Motor Company performed all the necessary testing and certification of emission-controlled models in strict compliance with the E.P.A. testing regulations. Suzuki motorcycle dealers are not required to either test or certify emission levels on any motorcycles as Suzuki Motor Company is legally responsible for the entire certification procedure.

E.P.A. regulations also provide fines for individuals who alter, render inoperative or improperly service emission-controlled motorcycles ranging up to $10,000.00 per motorcycle. It is essential that the individual servicing this emission-controlled motorcycle review thoroughly all the service procedures presented in this manual. Under no circumstances should the recommended service procedures be deviated from nor adjustments made which are not in accordance with the factory specifications or service procedures.

EMISSION CONTROL CARBURETOR COMPONENTS

GS850GL motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

There are several carburetor mixture control components in each carburetor assembly. Three (3) of these components are machined to much closer tolerances than standard machined carburetor jets. These three (3) particular jets – MAIN JET, NEEDLE JET, PILOT JET – must not be replaced by standard jets. To aid in identifying these three (3) jets a different design of letter and number are used. If replacement of these close tolerance jets becomes necessary, be sure to replace them with the same type close tolerance jets marked as in the examples shown below.

The jet needle is also of special manufacture. Only one clip position is provided on the jet needle. If replacement becomes necessary the jet needle may only be replaced with an equivalent performing replacement component. Suzuki recommends that Genuine Suzuki Parts be utilized whenever possible for the best possible performance and durability.

Conventional Figures Used on Standard Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0
Emission Type Figures Used On Close Tolerance Jet Components	1 2 3 4 5 6 7 8 9 0

The carburetor specification for the emission-controlled GS850GL are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
45160	#115	X–5	5D50	#40	PRE-SET DO NOT ADJUST

The pilot screw is pre-set by the factory utilizing specialized testing and adjusting procedures. The pilot screw is not adjustable as the idle circuit is "sealed" after factory adjustment. Adjusting, interferring with, improper replacement, or resetting of any of the carburetor components may adversely affect carburetor performance and cause the motorcycle to exceed the exhaust emission level limits. If persons, who are unaware of these special carburetor servicing requirements tamper with the carburetors the Suzuki dealer should restore the carburetors to their original condition or if unable to effect repairs, contact the distributors representative for further technical information and assistance.

GENERAL EMISSION INFORMATION

There are three different types of regulated exhaust emissions. They are:

Hydrocarbons (HC)
Carbon Monoxide (CO)
Oxides of Nitrogen (NOx)

Automobiles must meet specific emission standards for all three of these pollutants. Motorcycles must only meet the requirements for the following:

Hydrocarbons (HC)
Carbon Monoxide (CO)

HC exhaust emissions are basically unburned fuel vapors which have passed through the engine and escaped the combustion process.

CO exhaust emissions are formed during an incomplete combustion cycle as a result of a rich air/fuel mixture. The only way that CO can be produced is by the combustion cycle.

Total NOx emissions from all motorcycles is considered negligible. The EPA states that total NOx emission from motorcycles by 1990 will only amount to approximately 0.5%. NOx is formed during the combustion process at high combustion chamber temperatures.

CARBON MONOXIDE

Carbon monoxide is a product of an incomplete combustion cycle. CO is measured in grams per mile or kilometer and also in percentage (%)

The most common cause of CO is rich carburetion. As the mixture is richened excessively, the CO amount increases proportionately. Engine oil is also a hydrocarbon, so engine problems which lead to oil burning increase carbon monoxide.

CARBURETION MALFUNCTION

1. Air Cleaner – Dirty or over oiled.
2. Idle Mixture – Adjusted incorrectly.
3. Idle Speed – Too high or low.
4. Fuel Level – Sticking float, leaking needle, incorrect setting.
5. Choke – Leaking or linkage sticking.
6. Synchronization – Improper balance on multi cylinders.

ENGINE MALFUNCTIONS

1. Valve Seals – Leaking or torn.
2. Valve Guide – Worn and leaking excess oil.
3. Gaskets – Leaking oil into combustion chamber.

HYDROCARBONS

Hydrocarbons are unburned gasoline vapors and can be measured in two different ways. The first is to measure the weight of the pollutants over a specific distance such as grams per mile or grams per kilometer. The second method is to measure the concentration of HC in the exhaust gas in parts per million (PPM).

The most common cause of high HC emissions are ignition system problems. If the ignition system fails to ignite the fuel mixture properly, then raw gasoline vapors will pass through the engine into the exhaust system. Listed are the most common ignition problems which occur and which can affect HC emission output.

IGNITION SYSTEM MALFUNCTIONS

1. Spark Plugs – Fouled, dirty, improper type or improperly gapped.
2. Ignition timing – Advanced or Retarded.
3. Timing Advance – Too fast or too slow an advance rate.
4. Battery – Low charge or faulty.

Carburetion can also lead to high HC emissions if the mixture is either excessively rich or excessively lean.

MIXTURE-RELATED MALFUNCTIONS

1. Air Cleaner – Dirty, over oiled or torn.
2. Jets – Clogged, restricted or incorrect size.
3. Float Level – Level too low (lean) or too high (rich).
4. Choke – Leaking choke plunger or sticking linkage.
5. Air Leaks – Intake manifolds, engine gaskets and other sealing surfaces.
6. Synchronization – Unbalanced on multi-cylinder machines.
7. Exhaust System – Restricted flow or improper exhaust system.

Engine wear or damage can also cause high HC emissions.

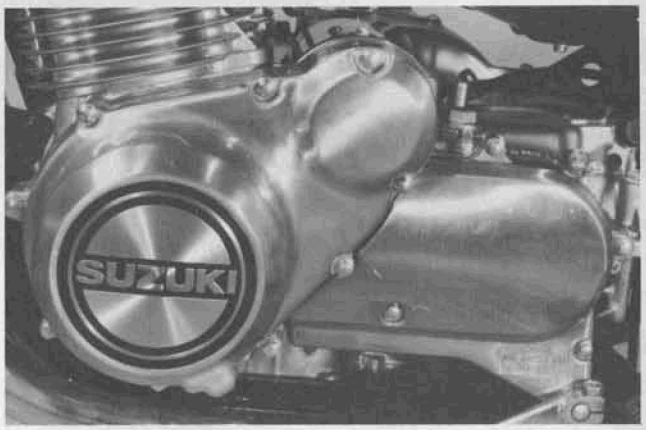
1. Rings – Low compression, leakage into crankcase.
2. Valves – Improper adjustment, bent stem or burnt.
3. Gaskets – Leaking, loss of compression.
4. Crank Seals – Leaking.
5. Oil Consumption – Worn valve guides, worn rings, clogged crankcase breather.
6. Oil – Improper engine oil.

COVER TIGHTENING BOLT

Cover tightening bolts has been changed from screw to bolt.

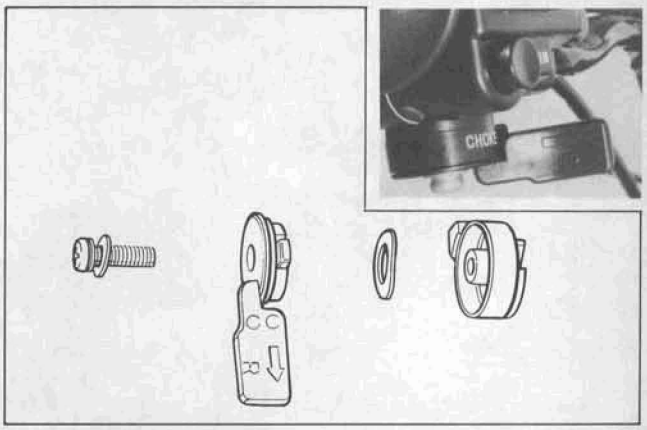
NOTE:
When unscrewing or tightening bolts use an allen wrench.

- Clutch cover
- Signal generator
- Generator cover
- Secondary drive unit cover
- Starter motor cover



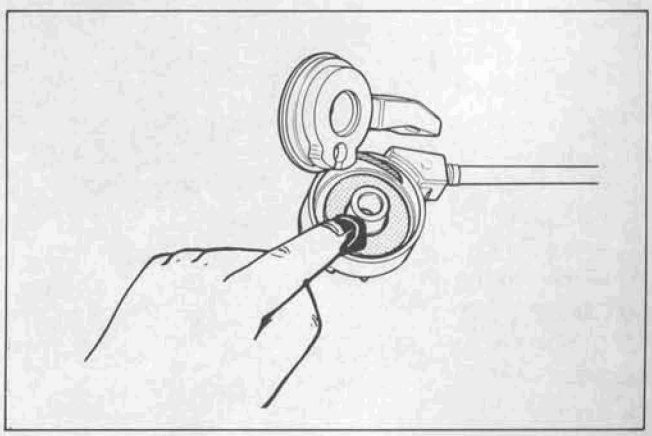
STARTER LEVER

- Remove the starter lever and starter cable.

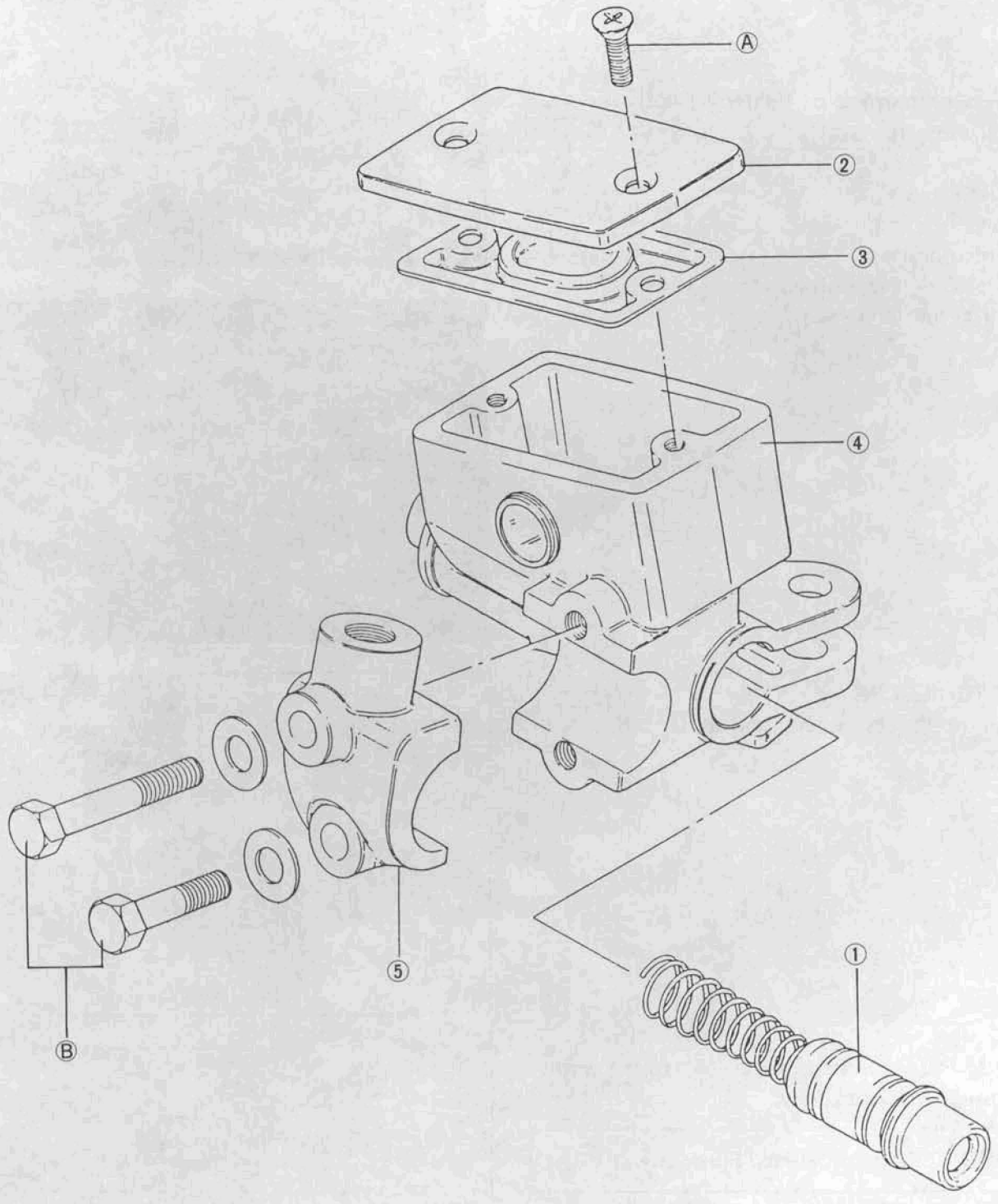


- Apply Suzuki Super Grease "A" to the washer before tighten the screw.

99000 - 25010	Suzuki Super Grease "A"



FRONT MASTER CYLINDER

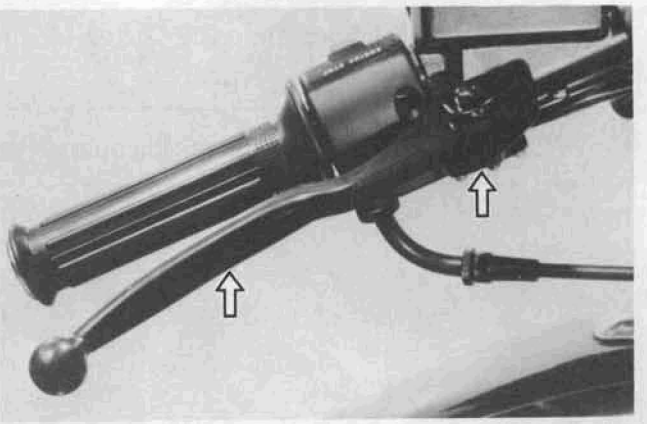


① Piston and cup set
② Cap
③ Diaphragm
④ Body
⑤ Holder

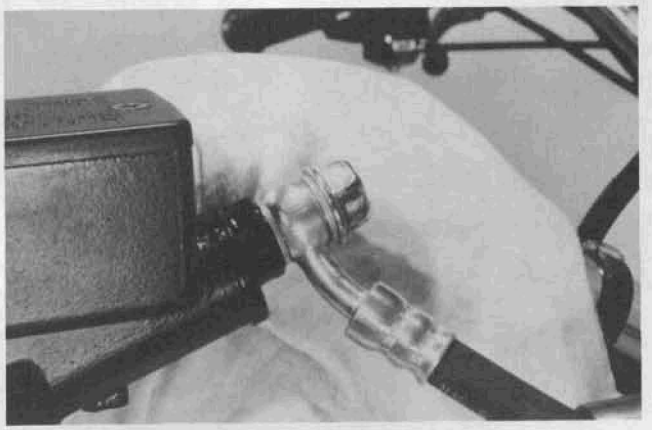
	Tightening torque	
	kg-m	lb-ft
Ⓐ	0.08 – 0.15	0.6 – 1.1
Ⓑ	0.5 – 0.8	3.5 – 6.0

MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Remove the front brake light switch and front brake lever.



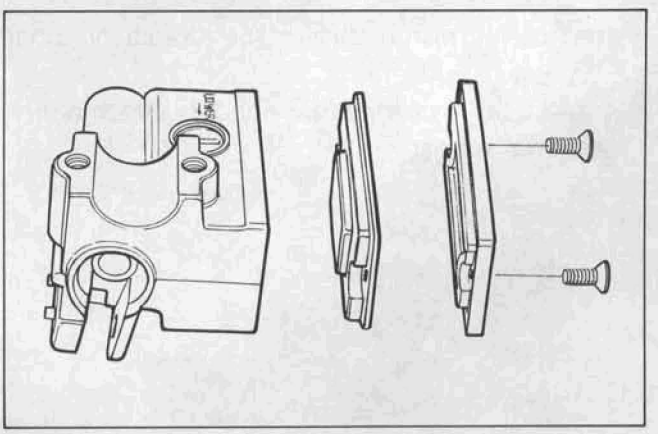
- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.



CAUTION:
Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paints, plastics, rubber materials, etc. and will damage them severely.

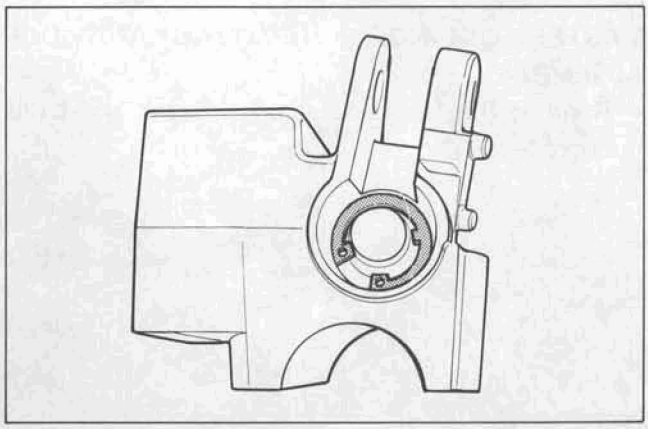
- Remove the master cylinder ass'y after removing two fitting bolts.

- Unscrew two fitting screws and remove the cap and diaphragm.

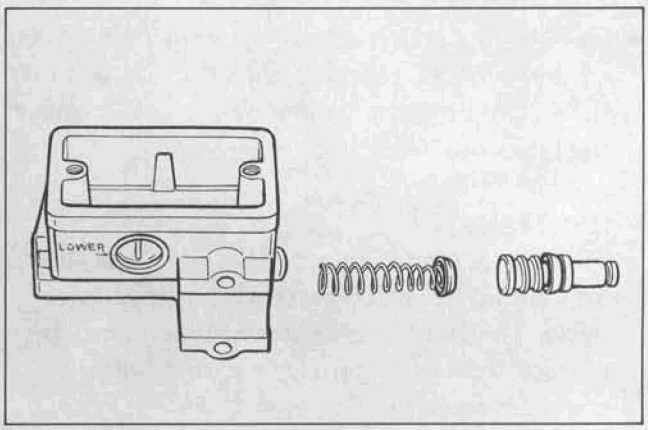


- Pull off dust seal boot and remove the circlip by using special tool.

09900 - 06108	Snap ring pliers

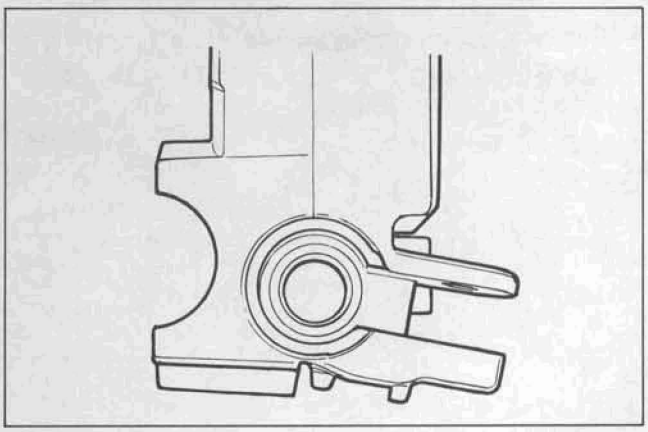


- Pull out piston, primary cup and spring.

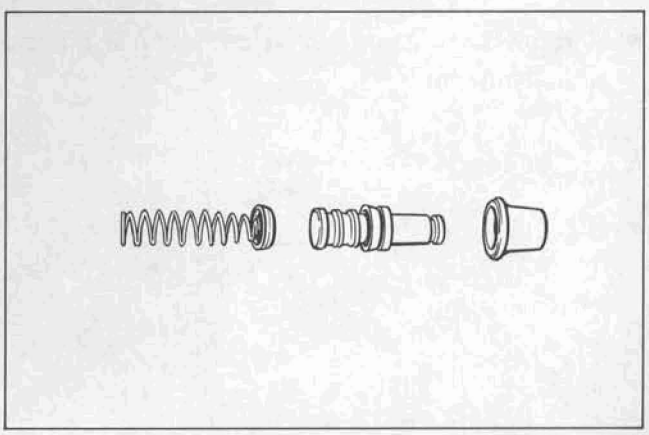


MASTER CYLINDER INSPECTION

- Inspect the cylinder bore wall for any scratch or other damage.



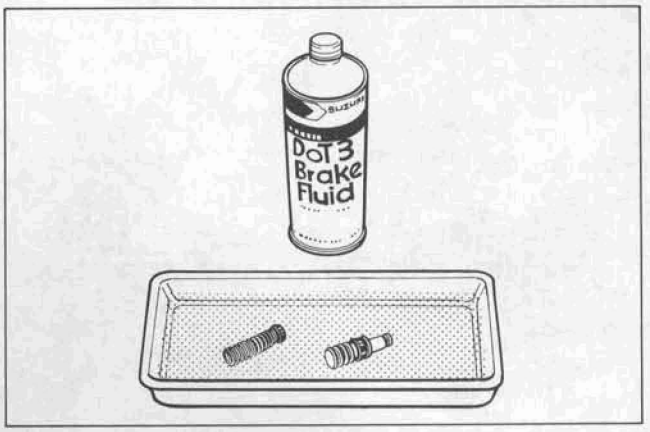
- Inspect the piston surface for scratch or other damage.
- Inspect the primary cup, secondary cup and dust seal boot for damage.



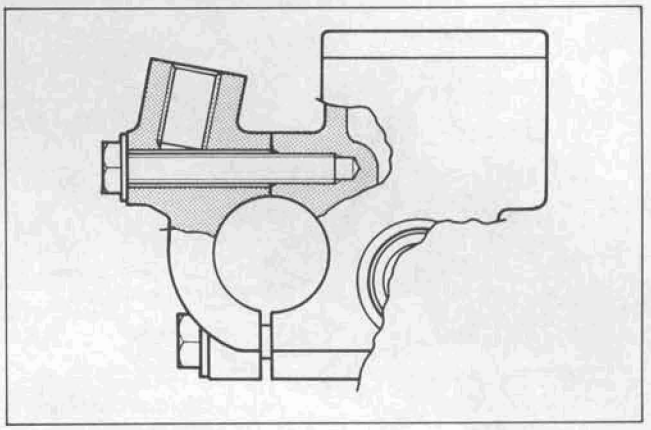
MASTER CYLINDER REASSEMBLY

- Reassemble the master cylinder in the reverse order of disassembly and by taking the following steps:

CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them. Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

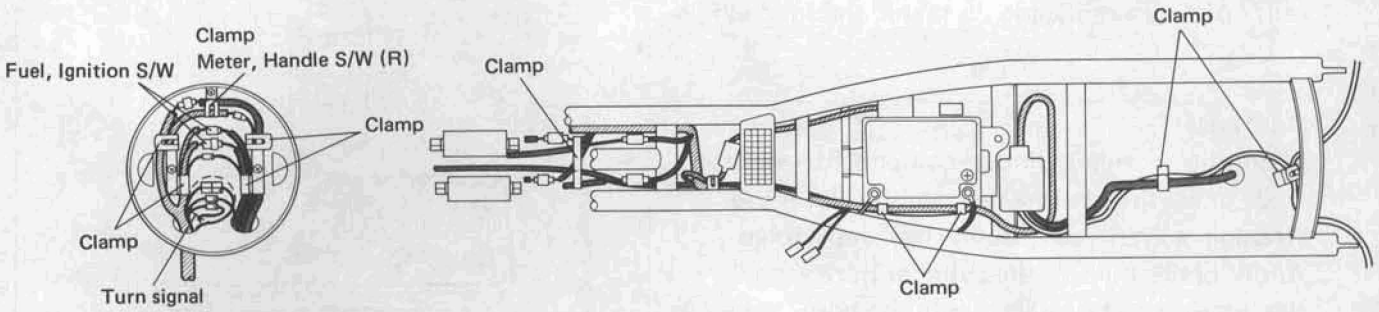


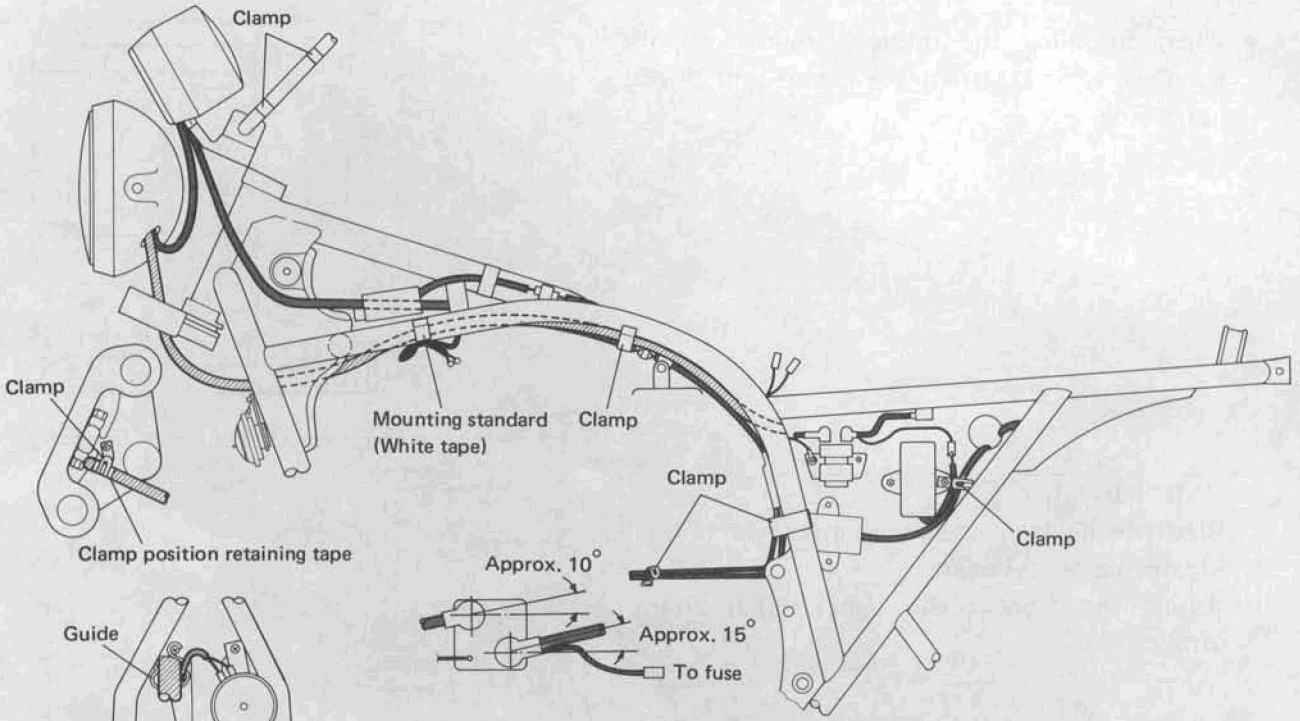
- When installing the master cylinder on the handlebars, first tighten the clamp bolt on the upper side.

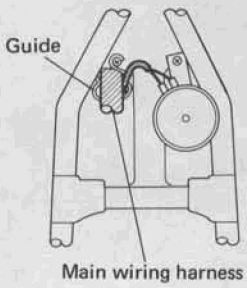


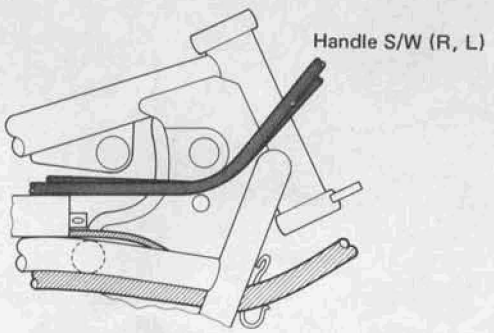
CAUTION:
Bleed the air from the circuit after reassembling the master cylinder.
Adjust the front brake light switch after installation.

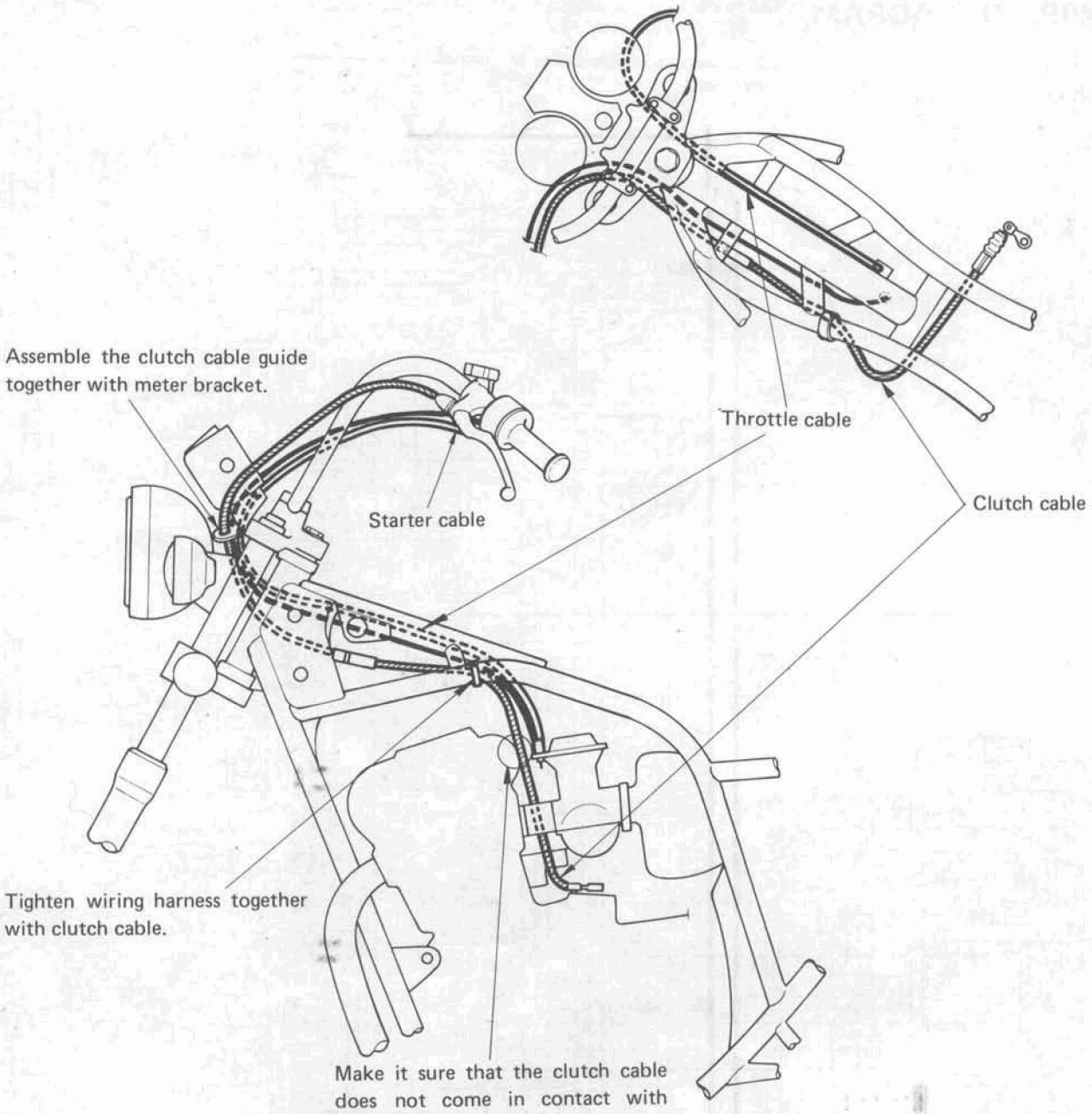
WIRE AND CABLE ROUTING

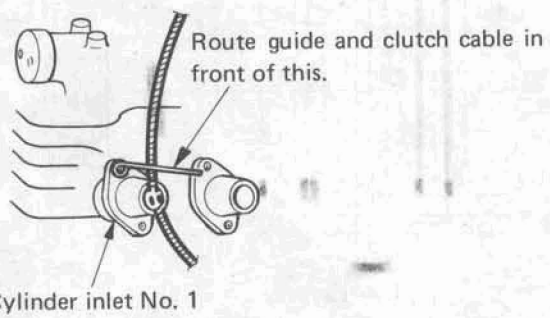




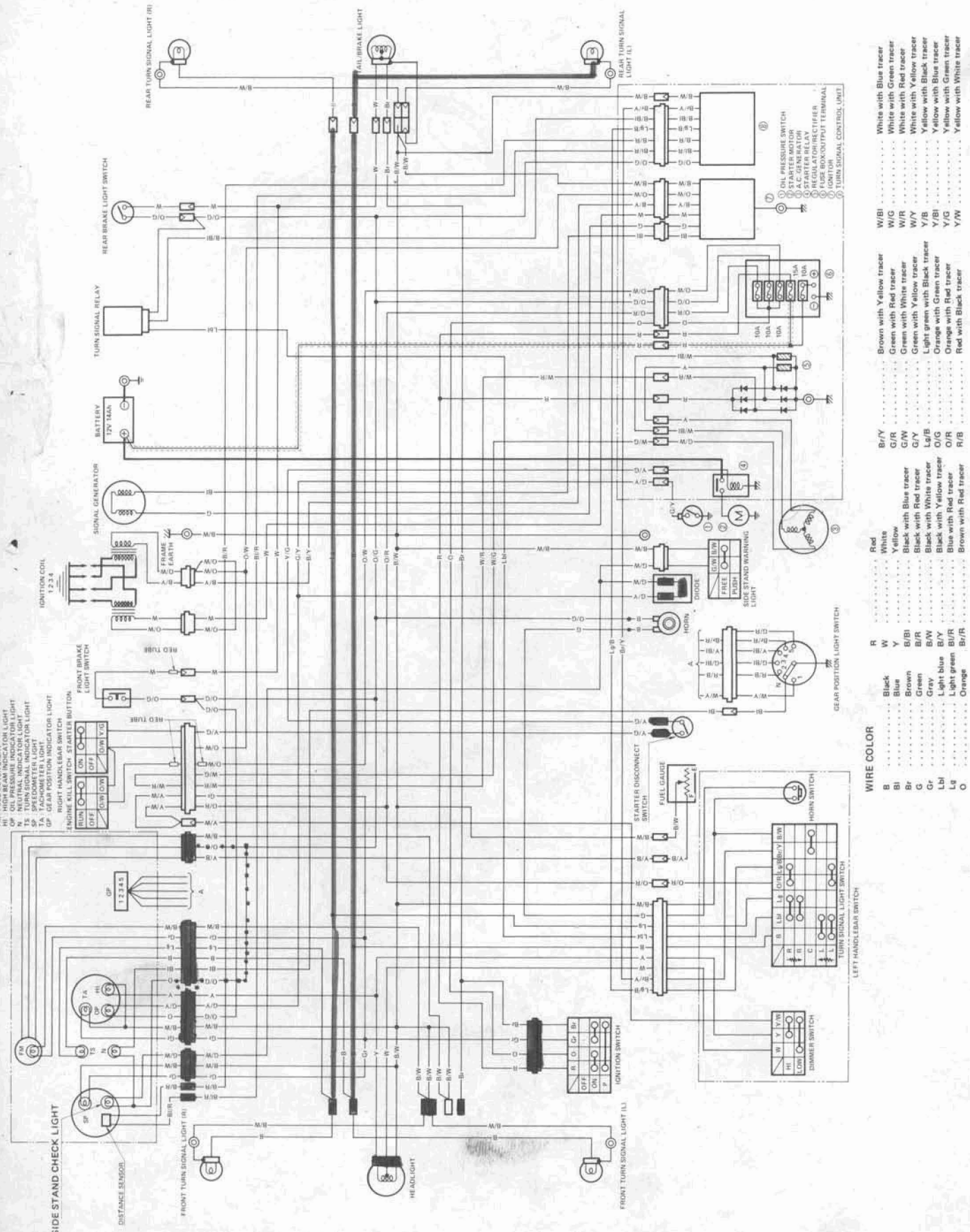





Assemble the clutch cable guide together with meter bracket.
Throttle cable
Starter cable
Clutch cable
Tighten wiring harness together with clutch cable.
Make it sure that the clutch cable does not come in contact with cylinder head at this point.


Route guide and clutch cable in front of this.
Cylinder inlet No. 1

WIRING DIAGRAM



WIRE COLOR

B	Black	R	Red
Bl	Blue	W	White
Br	Brown	Y	Yellow
G	Green	B/Bl	Black with Blue tracer
Gr	Gray	B/R	Black with Red tracer
Lbl	Light blue	B/W	Black with White tracer
Lg	Light green	B/Y	Black with Yellow tracer
O	Orange	Br/R	Brown with Red tracer
		Br/Y	Brown with Yellow tracer
		G/R	Green with Red tracer
		G/W	Green with White tracer
		G/Y	Green with Yellow tracer
		Lg/B	Light green with Black tracer
		O/G	Orange with Green tracer
		O/R	Orange with Red tracer
		R/B	Red with Black tracer
		W/Bl	White with Blue tracer
		W/G	White with Green tracer
		W/R	White with Red tracer
		W/Y	White with Yellow tracer
		Y/B	Yellow with Black tracer
		Y/Bl	Yellow with Blue tracer
		Y/G	Yellow with Green tracer
		Y/W	Yellow with White tracer